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VETERINARY MEDICINE

MAY 1944

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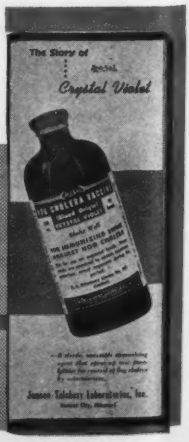

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In the production of the various sulfa drugs over 50 different chemicals are used.

It was estimated in 1941 that 50,000,000 farm animals in the Soviet Union alone had been produced by artificial insemination.

Guinea pigs that survive an invasion of *Ascaris lumbricoides* larvae of the lungs are resistant thereafter for a period of three months to infection by this parasite.

Veterinary meat and dairy hygiene reports indicate that, of troops in the United States, the average daily consumption of fresh milk is a little over a half-pint per man.—*Bul. U. S. Army Med. Dept.*

The typhus fever that has broken out in Naples is spread by the louse—the American variety is spread by rat fleas. European typhus has a greater mortality, being from 20 to 40% as compared with the American type which is about 2%.

American troops in regions where louse borne typhus exists have been given a vaccine which is believed to give protection to both varieties of the disease. In addition troops are supplied with a dusting powder which repels lice. A vial of methyl bromide when put in a special type of bag with soldiers' clothes and when broken releases fumes which kill lice.

New Mexico established the first live stock sanitary board in the United States in 1895. It was known as the "Cattle Sanitary Board of New Mexico."

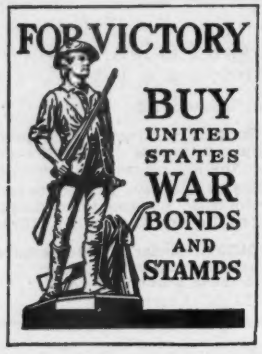
A ration containing adequate vitamins and minerals is more likely to be efficiently utilized than a ration in which the supply of these ingredients is minimal or marginal.

Sulfonamide drugs were used in the treatment of a large number of cases of meningitis last year with the result that the mortality, heretofore 17% in this disease, was reduced to 3%.

The choice of a worm medicine should depend upon the worm to be removed, the efficacy of the medicine and the safety of the drug for the animal. In the selection of worm medicine, the margin of safety must be borne in mind constantly.

Herbs and animal extracts employed in Chinese medicine three centuries before this era are still used and highly appraised in the U. S. Pharmacopeia. An extract made from boiled toads having about the same action as digitalis was employed for dropsies and heart affections and ground dragon bones was the calcium therapy used for convulsions. The Chinese practiced inoculation for the prevention of smallpox at least five centuries before Jenner.

Worthless poultry remedies sold by those who are willing to profit from the misfortunes of poultrymen, constitute a heavy drain upon the poultry industry.—*H. J. Stafseth.*



The poultry disease problem is a challenge to the veterinary profession. Veterinarians are the only group with the fundamental training to handle poultry disease, and yet they have largely neglected it.

In experiments conducted by Gwatkin and Mitchell it was shown that the common house fly can carry *Samonella pullorum* from the chicks, dead of the disease, or from contaminated mash to non-infected chicks or to their feed.

Feed from Incubators

As a starting and growing diet for chicks the Beltsville Research Center, through extended experiments, has found that dried incubated fertile eggs supported at least as rapid and efficient growth as a combination of dried skim milk, meat and bone scrap, and fish meal. It is estimated that refuse from commercial hatcheries produced more than 12,000 tons of dried incubator eggs (shells and contents) or 9000 tons of the dried contents, which contents would yield nearly 6,000 tons of animal protein supplement feed of about 70% of protein as well as 3,000 tons of fat suitable for industrial use. Hatchery eggs to be used for poultry feed should be boiled for 15 minutes or more to destroy pullorum disease organisms they may contain.

For a number of years the loss of poultry, chiefly from disease, has been increasing in birds three months of age and older. In 1943, this trend was reversed and the loss was 3% less than in 1942. This effected a saving of 70 million pounds of poultry meat.

Cull the Flocks

Efficient egg production in 1944 can be accomplished only by culling flocks to about the 1943 number. If this is done, our poultry meat supply will be increased by the cull birds, and egg production will probably exceed that of 1943 because the layers retained will be the cream of the flock.

Everybody's Poultry Journal

"Say, what have you got to crow about? Who's laying the eggs for this war food production . . . you or us?"

To meet wartime food requirements we need all the poultry, meat and eggs that can be produced with the available feed, labor and materials, but it is not likely that the 1944 feed, labor and material supply for poultry will be much greater than they were in 1943.

Careful records show that in a 100-bird laying house, rats may eat as much as $25 worth of feed a year, a loss of 25 cents per hen, says Dr. Morley A. Jull, head of the poultry department, University of Maryland.

Buildings should be made as rat proof as possible. He advises that feed be placed on supports at least 6 inches above the floor so that cats can get underneath. For poisoning, he recommends the use of red squill because it can be used safely around humans and livestock, including poultry.—*Everybody's Poultry Journal.*

Early Research on Penicillin Aided by Foundation

In May, 1936, the Rockefeller Foundation, New York, received a request from Dr. H. W. Florey, Professor of Pathology at Oxford, England, for a grant of $1280 for some special laboratory equipment. This was followed each succeeding year for further grants, none exceeding $5,000. As a result of Doctor Florey's research penicillin was developed. Seldom has so little produced so much. The foundation had a significant part, also, in the development of the sulfonamide drugs.

A Necessity for Public Health

Of all the protective measures which are applied to milk, proper pasteurization is by far the most important single safeguard. Milk which has been properly produced, properly pasteurized, and protected against subsequent contamination, is safe milk. No raw milk can be guaranteed as safe. In most sections of the United States, pasteurized milk is now available, but there are still many areas in which there is no pasteurized milk. In these areas, the public health responsibility of insuring a safe milk supply cannot be discharged until properly pasteurized milk is available in sufficient quantity.—(U. S.) *Pub. Hlth. Repts.* 59:6, p. 189.

Sulfadiazine in Actinomycosis

Lt. David Tornoff, M.C., reports (*J. Am. Med. Assn.*) the successful treatment with sulfadiazine, of a case of actinomycosis in a soldier. The disease was well established and involved the mandible, both sides of the face and the anterior surface of the neck. Treatment required 120 days and recovery was complete.

In view of the fact that occasional cases of actinomycosis (or actinobacillosis) are resistant to sodium iodide therapy the success of sulfadiazine even in this single case might justify a trial of it in animals of unusual value. The drug was administered by the mouth, one gram four times a day. The patient suffered no ill effect from this small daily dose over a period of four months.

Citrinin, one of the new antibacterial substances of microbial origin is reported[1] to inhibit growth of *Staphylococcus aureus* in dilution of 1 to 50,000. Therefore, it is not so powerful a bacteriostatic agent as penicillin but, taking into consideration its stability, ease of purification and comparative high yield, it must be regarded as a promising antibiotic agent.

Prevention of Tetanus in Dogs

It is stated by Stern* that antitetanic serum injected directly into the spinal cord of dogs by the suboccipital route, arrests the development of tetanus and the animals make a speedy and complete recovery. As a rule, such favorable results are obtained only if the treatment is begun within the first 24 hours. The intraspinal injections of the antitetanic serum sometimes proves effective in horses. The injections may be repeated several times.

The author has given the serum simultaneously into the blood along with the spinal injections and saved a patient with tetanus. A preliminary withdrawal of an amount of the spinal fluid equal to the dosage of serum given is made. The aim of the simultaneous injection of the serum into the blood is to render innocuous the toxin in the blood.

Venezuelan Virus of Encephalomyelitis Pathogenic for Man

During the late summer of 1943, 70 fatal cases of encephalitis occurred among horses and mules in Trinidad, British West Indies. The disease was diagnosed clinically as infectious encephalomyelitis and this was confirmed by specimens sent to the Veterinary Laboratory at the Army Medical Center, Washington, D. C. Later a specimen of brain tissue was received at the laboratory from a human case of encephalitis and it also revealed the Venezuela type of encephalomyelitis virus.

This is the first instance in man in which the Venezuelan strain of equine encephalomyelitis has been proved to occur naturally, producing a fatal infection.

[1] Oxford, A. E. *Chem. & Ind.*, 61, p. 48, 1942.
*Stern, L., Treatment of tetanus. *Ill. Med. J.*, 84, p. 387, 1944.

Notes from Livestock Sanitary Meeting*

C. M. Haring of the University of California, discussed "The effects of *Brucella Abortus* strain 19 on cattle of various ages and its bearing on the question of adult vaccination." J. Traum was co-author of the paper.

Essentially, the paper was a continuation of the reports these authors have been making for several years detailing their experience in the use of strain 19 vaccine under controlled field conditions. The study has now extended over a period of more than ten years. Nothing in their experience during the past year disagreed with earlier reports which have been reported in these pages. New conclusions or tentative conclusions of former years which have been fully established during the past year are:

1. It is doubtful that vaccination of calves under four months of age affords such animals any additional protection against brucellosis.

2. Vaccination of uninfected cattle eight months of age or older affords a high degree of protection against naturally acquired infection.

3. Greater resistance is developed by vaccination in mature cattle than in younger animals and the agglutinins persist longer in such animals.

4. When the negative animals in an infected herd are vaccinated a majority of them gradually become negative again. The vaccination of reactors is not advised because the injection of strain 19 into such animals has no beneficial effect and appears to increase the percentage that never becomes negative.

5. Vaccination of clean herds does not result in spread of the infection.

6. Thousands of dairymen in California have found vaccination of heifers and mature cattle superior to testing and slaughter.

7. Herds can be cleaned by calf and heifer vaccination. In experiments extending over a period of more than 10 years and involving herds of all sizes up to 1700 head, there has been no failure to eradicate the disease in the time required for the original reactors to become negative, or unprofitable and be disposed of for economic reasons.

Melvin Rabstein, University of Maryland, gave his experience with the Dunloggin herd, a herd of vaccinated animals of which 250 sold for an average price of $873 in September of this year. This herd was assembled in 1928. It was first tested in 1935 and two reactors found and removed. In 1938 this herd, then numbering 280, was accredited brucellosis free. Nine months later, several animals aborted and a test of the whole herd revealed 13 reactors, two weeks later five more reacted. Six more tests at two week intervals showed 35 reactors and 18 suspects of which eight became positive later. All were removed from the herd and quarantined on another farm. It was obvious that there would have to be a change of policy or the herd would be destroyed. A program of vaccination was undertaken with the results shown in the September sale, the proceeds of which were $228,250. Of the 43 quarantined reactors, 24 became negative within 30 months.

Porcine Brucellosis

L. M. Hutchings, Purdue University, discussed porcine brucellosis holding that this is an important disease of swine but there are no dependable statistics to say how costly. It appears to be on the increase. Moreover swine may act as a reservoir for brucellosis in cattle, since cattle are susceptible to the *Brucella suis* and the swine strain, whether deriving from swine or cattle, is more infective for man than the abortus strain. Jordan found 27% of undulant fever was due to the porcine organism. When it gains access to milk, which is consumed raw, an epidemic is certain.

Abortion in swine is not always a symptom of brucellosis although it may be. The author has known of herds of swine in

*Forty-Seventh Annual Meeting of the United States Live Stock Sanitary Association, Chicago, Dec. 1-3, 1943.

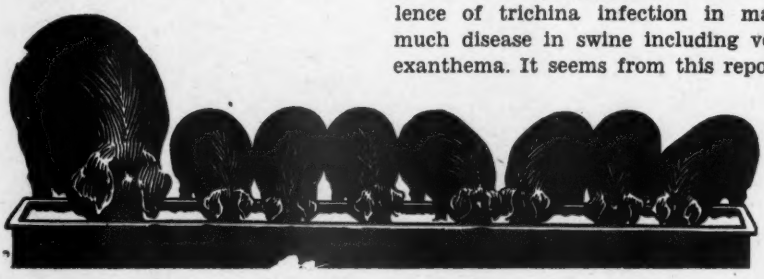
which up to 80% of the sows were reactors and yet abortions occurred only in recently infected animals, usually gilts. Sterility (possibly early abortions) and arthritis are more common than abortions. The author has isolated *Br. suis* from the semen of many boars and regards the boar as an important factor in the spread of the disease. The agglutination test is a valuable herd test but is not dependable for the individual animal. All animals in contact with infected animals should be regarded as infected.

To eradicate the disease from an infected herd, sell all the animals for slaughter and start over again with clean animals —if they can be found.

Mortality of Baby Pigs

Pig mortality was discussed by H. C. H. Kernkamp of the University of Minnesota. The discussion concerned the first two months of postnatal existence.

Pigs should not be separated from sows



at younger than 56 days of age. A shorter period is hazardous unless the pigs receive special care.

Natural weaning is dangerous to the sow because it sometimes extends for as long as 15 weeks and, by this time, the sow may have been so weakened that her future usefulness is seriously impaired or even death may result.

In a report made to the United States Live Stock Sanitary Association in 1942, it was indicated that the pig losses, in a herd of 75 swine in which careful records were kept, were 37% for the period extending from birth to weaning. Kernkamp indicated that he had kept a careful record during the past year in other herds and he had found a death loss averaging 24%.

In still another survey involving 235 sows in two townships on 35 farms the pig loss from birth to weaning was 25%. To indicate the enormity of this loss Kernkamp stated that according to the federal census in 1935, 30 million pigs were born. At that rate, 7½ million died before they were weaned.

Careful records kept at the University of Minnesota indicate that there are approximately 35 diseases or conditions responsible for pig losses between the period of their birth and weaning. These ailments include nutritional diseases, navel infections, hog cholera, dysenteries, internal hemorrhagic trauma, pneumonia, gastroenteritis, etc.

Garbage Feeding

C. U. Duckworth, Administrator of the California Division of Animal Industry, presented an interesting and important report on vesicular exanthema in California. The feeding of raw garbage to swine has been under fire for some time because it is responsible for the major part of the prevalence of trichina infection in man and much disease in swine including vesicular exanthema. It seems from this report that the latter disease may solve the problem by making raw garbage feeding unprofitable. Were it not for the unusually high price of hogs at the present time this disease in California would render garbage feeding unprofitable. There is reason to believe that the disease will eventually spread to all sections where raw garbage feeding is practiced and with similar result.

During the past several months outbreaks of vesicular exanthema have occurred almost weekly among the hogs held for slaughter in the San Francisco stockyards and less frequently in the Los Angeles stockyards.

Since every appearance of this disease

must be considered a possible outbreak of foot-and-mouth disease, until inoculation tests determine otherwise, it means quarantines, yard disinfection, tracing the animals back to the farms and inspection of the premises from which they came. According to Duckworth, the first outbreak, which occurred 12 years ago and was mistaken for foot-and-mouth disease, entailed the expenditure of $203,000 of public funds. The second outbreak occurred in 1933, and was even more extensive. The following year the third outbreak involved 95,000 hogs. There were minor outbreaks in 1935 and 1936, and none in 1937 and 1938. In 1939, there were involved 222,000 animals —since the disease has been widespread.

Vesicular exanthema causes marked shrinkage in fat hogs, death of many young pigs, abortion in pregnant sows and many condemnations on post-mortem meat inspection.

Four strains of the virus have been isolated.

Vesicular Stomatitis

An outbreak of vesicular stomatitis among the hogs in a serum plant was reported by Harry W. Schoening, Chief of the Pathological Division of the Federal Bureau of Animal Industry. It was the first naturally occurring outbreak of this disease, recognized in this animal. It has long been known that swine can be inoculated with the virus of vesicular stomatitis by intravenous injection, and it is assumed that it was in this way that this outbreak was propagated, i.e., the virus blood injected into these animals contained the virus of vesicular stomatitis in addition to the hog cholera virus. However, a careful examination of the premises from which the virus pigs were obtained failed to reveal any evidence of the disease in swine or in any other animal.

Vesicular stomatitis is indistinguishable clinically from foot-and-mouth disease. Any outbreak of the former necessitates the most stringent quarantines until its true nature is determined by inoculation tests. In this case, 48 anxious hours were required to determine it was not foot-and-mouth disease.

In this instance, contrary to previous experience with vesicular stomatitis in swine, it spread rapidly to other animals by contact. This, it is thought, may have been due to the enormous amount of infection to which in-contact animals were exposed.

The lesions occurred principally upon the snout and feet and were so severe that the cuticle peeled from the snout leaving it raw and bleeding and feet were so painful the animals could not walk. Many of the hoofs came off.

There are two types of vesicular stomatitis virus (New Jersey and Indiana). Clinically they are indistinguishable but they differ immunologically.

Rabies Control

H. N. Johnson, Acting Director, Rabies Laboratory of the International Health Division, The Rockefeller Foundation, stated, in a discussion of rabies in Alabama, that vaccination had proved to be the most effective method of rabies control and had effected the prompt eradication of the disease in the city and county of Montgomery. Cases that have since occurred in that city in imported dogs have not spread to native animals. The opinion was expressed that anti-rabies vaccine now available is much superior to the product formerly marketed.

In 1937, Alabama enacted a state law requiring the annual vaccination of dogs. In that year, 177,039 dogs were vaccinated. A rapid reduction in the prevalence of rabies occurred and in three years the disease practically disappeared from most of the counties. Some counties failed to make an appropriation for enforcement of the law and the disease continued in them.

In Montgomery County 6,012 dogs were vaccinated in 1936, and that year 23 positive heads were sent to the health department. In 1937, and each year since, approximately 7,000 dogs have been vaccinated. The health department found 29 positive heads in 1937, but none for the past five years in native dogs. A very few cases of rabies have occurred in imported dogs but there has been no spread of the disease, except in 1943, a cat was infected by a dog that had been brought to Montgomery recently from Florida.

During 1943, 219 cases of rabies occurred in the state. Of this number 157 cases occurred in one county that has never made any attempt to enforce the state vaccination law. Most of the remaining 52 cases occurred in counties bordering Tennessee and Georgia, where the disease was prevalent just across the state lines.

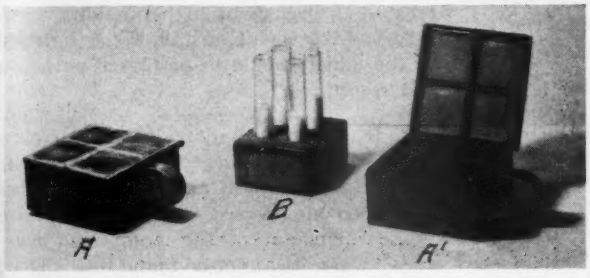
Army Milk Inspection

Inspection of the milk supply for army camps was discussed by Col. J. E. Noonan, V.C. The problem of obtaining sufficient milk of a satisfactory quality for military camps and other army installations was often a difficult one. Camps were established no outbreaks of illness among the troops and grew to a size of perhaps 50,000 in a few weeks. Many were located in relatively sparsely settled communities where there was barely adequate milk production for the civilian population. In some instances arrangements were made to ship the milk needed by truck or rail. In some cases the veterinary officers were able to induce dairy farmers to increase their production sufficiently to supply the camps, without depleting the supply of fluid milk for the civilian population.

In some of these communities there was no state or local milk control of any sort. The farm and processing plant equipment was inadequate for producing sanitary milk and little knowledge of how it should be done was possessed by either the farmers or the operators of the processing plants. Nevertheless by farm and plant inspections and a good deal of educational work, the army veterinary service was able to improve the supply to an extent that it met army requirements. There have been no outbreaks of illness among the troops which were attributed to the milk.

Community Sales

Community sales have been widely condemned as prime spreaders of diseases of livestock and in the past their performance has justified the charge. However, J. M. Sutton, of Georgia, took the position that properly regulated auctions are advantageous to the livestock industry in the communities where they are established. During the past 20 years a large number of livestock auctions have sprung up in the South. Ninety percent of the animals sold at these auctions are produced within a radius of 50 miles. In communities where 10 years ago the farmers produced no surplus animals, auctions now handle as many as 1,000 animals per month. Many of the sales are to local butchers. But for this market, the animals would not be raised and the butchers would handle imported meat.



CONVENIENT SAMPLING EQUIPMENT FOR THE HAYDEN CHLORIDE TEST FOR MASTITIS

A (closed) and A' (open) strip cup having four compartments and a hinged, fine wire screen cover. B. Wooden block holder for wide mouth test tubes

Most of these auctions have grown up without restraint or regulation by the authorities and there are bad spots. Doctor Sutton mentioned as weaknesses in these sales:

1. Lack of sanitation.
2. Appointment of other than veterinarians for inspectors.
3. Not licensed by the State Livestock Sanitary Board.

Only a few states have specific laws regulating auction sales. Some livestock sanitary boards are attempting to control public livestock auctions by regulations only, without specific provision of law.

The Wyoming law (enacted in 1937) regulating livestock auctions was recommended as a model for those states having no laws, or inadequate laws, regulating this popular institution.

Cattle Diseases

A round-table discussion of cattle diseases was participated in by various members of the Association.

Paul Philips: The symptoms of vitamin A deficiency in calves are, slight cold, nasal discharge, epiphera, scours, well developed pneumonia and death. It is practically impossible to prevent scours and pneumonia in vitamin A deficient calves and practically impossible to induce these conditions in calves having a normal vitamin A content of the blood. Colostrum is three times as rich in vitamin A as normal blood.

Nicotinic acid may be necessary to the absorption and utilization of vitamin A. Seventy-five percent of the cases of vitamin A deficiency in calves respond to the administration of vitamin A; 25% require nicotinic acid also.

■

Vitamin C is important for the fertility of bulls. Vitamin E is not. No animal that we know of except the rat requires vitamin E for reproduction. If cattle are benefited by the administration of wheat germ oil it is due to some factor other than vitamin E.

Herbert Lothe: Stilbestrol has a place as an aphrodisiac in the cow. It is excellent in pyometra since it empties the uterus promptly. In cases of mummified fetus it may have to be repeated. In cases of deep-seated, retained corpus lutea it may induce nymphomania and cause cystic ovaries.

In cases of anestrum it will bring about a normal appearing heat period in 24 to 72 hours but apparently ovulation does not occur since animals bred at this first estrus period seldom conceive. However, a second heat period usually occurs 21 days after the first and the animal will usually conceive if bred at that time. After the first heat period the ovaries should be examined for cysts. These cysts are common and should be broken down.

■

Trichomoniasis is common in cattle. In some herds it is easily handled, in others it is difficult. Treatment comprises: (1) disposal of the bull, (2) suspension of all breeding for a period, (3) relief of all cases of pyometra, and (4) not breeding cows that have recovered, to a non-infected bull. Some infected bulls are fertile, others are hopelessly sterile.

W. R. Krill: Milk fever is a misnomer since there is no fever attending this ailment. Dryerre and Greig showed that hypocalcemia is a fairly constant concommitant of this disease. One-half gallon of colostrum contains as much calcium as all the blood in a cow.

Irradiated yeast, rich in vitamin D, has been tried as a preventive of milk fever. There is some evidence that it may do some good in the Jersey. Parathyroid extract has been tried, but is ineffective as a preventive.

Atmospheric conditions influence the occurrence of milk fever. It is noticeably increased in periods of high humidity.

In the treatment of milk fever, inflation of the udder should be employed only as a last resort.

R. R. Dykstra: A diagnosis of anaplasmosis can be established only by the successful inoculation of a susceptible member of the bovine species. There are stages in the development of the *Anaplasma marginale* when it cannot be found in the blood by microscopic examination. Boynton and Woods have reported success with a serum test but it has not as yet been extensively used.

In nature, the disease is transmitted from one animal to another chiefly by ticks. Biting flies may act as mechanical vectors. Contaminated instruments are sometimes responsible for spreading the disease.

Infected animals recover only to become immune carriers. The disease will flare up anew in any recovered animal after splenectomy.

The best treatment for clinical cases is sodium cacodylate. It should be administered intravenously in 5% dextrose solution, 4½ grains of cacodylate to the cubic centimeter of the solution. The dose of sodium cacodylate is 25 to 30 grains per 100 pounds of body weight.

Recovered cases, i.e., immune carriers should be disposed of before the next fly season. Great care should be exercised in drawing blood samples from infected animals or immune carriers for the brucellosis test, since sufficient blood to transmit the

disease may easily adhere to a hypodermic needle.

■

Actinomycosis should be diagnosed clinically only when bone is involved. When soft tissues only are involved the disease is usually actinobaccillosis. However, differentiation is not essential to treatment, since both organisms are sensitive to iodine.

There is no specific preventive of either disease, i.e., no artificial means of immunizing animals to either ailment. Since the disease gains entrance through abrasions the routine treatment of all abrasions with iodine will prevent some cases. Discharge from the abscesses should not be permitted to contaminate the environment of cattle. Since both diseases are slightly transmissible to man, precautions should be observed by the caretaker and the veterinarian.

■

Listerellosis, better termed listeriosis is a disease chiefly of sheep, cattle and swine, chickens, also, are susceptible. In sheep, which are more susceptible than cattle, it is sometimes called circling disease.

The symptoms are nervousness, incoordinated gait, walking in circles and progressive paralysis, but the disease cannot be diagnosed clinically with finality. This ailment occurs sporadically and the means of its transmission are not understood. Treatment is symptomatic.

■

James Farquharson: Diseases of range cattle, commonest in the fall of the year, are somewhat loosely called shipping fever, stockyards fever and hemorrhagic septicemia. There is a disease entity we may properly call shipping fever but it is not necessarily hemorrhagic septicemia. The latter disease is seen only occasionally in range cattle. Shipping fever may, and does occur in cattle that have been vaccinated against hemorrhagic septicemia. Cattle should not be vaccinated against the latter disease just before shipping, when they are exhausted, after they have been fed heavily or when they are suffering from lack of water.

Shipping fever can be prevented by shielding the cattle from hardship as they are collected from the range, shipped to the feed lots and placed on full feed. They should be driven slowly from the range and allowed to eat as they go. In shipment protect them from extremes of heat and cold. Don't ship in inclement weather. Avoid crowding, over-fatigue, starving and lack of rest. All contribute to lowering the resistance of the animals.

At their destination give rest and shelter and allow them to range on stubble fields for a few days. Permit access to good water.

Individual handling of these wild, scared animals does the sick more harm than good unless the attack be very severe. Severe cases should be given expectorants, guaiacol, and sulfa drugs including sulfasuxidine. Coccidiosis occurs in western feed lots and occasions considerable loss. It is unimportant on the range.

■

Acute pulmonary emphysema is common in range cattle. The symptoms are those of anoxemia. Edema of the lungs is the only lesion. It is probably due to an allergy. It has attracted attention only during recent years.

■

R. B. Little: Mastitis in the cow presents many unsolved problems. Streptococci and staphylococci are the organisms commonly found in the diseased udder. Coliform organisms and *Corynebacterium pyogenes* are sometimes found, but the possibility that bacteria are but secondary invaders of a field prepared by a virus cannot as yet be dismissed. The predisposing causes are not well understood. Over-working the udder, milking in advanced lactation, improper adjustment of the milking machine, traumatism and exposure—all are looked upon as predisposing factors, as are also certain endocrine disturbances and dysfunction of the ovary and adrenal cortex.

In the lactating udder gramicidin or tyrothricin is the better injection. Injection of the udder is a surgical operation and should be intrusted only to professional hands. In selected cases the recoveries have reached 80 or 90%; in the average herd 50% recoveries are high.

If infected milk is fed to calves it should first be pasteurized or the calves should be prevented from sucking one another for two or three hours after feeding.

Miscellaneous Transmissible Diseases

The report of the committee on miscellaneous transmissible diseases indicated the following:

1. Foot-and-mouth disease is not present in Central America, nor in North America, but it is becoming increasingly difficult to keep it out.
2. Equine encephalomyelitis presents difficulties of study because it is almost impossible to get specimens.
3. Dourine is still present in the southwest.
4. Anaplasmosis is gradually spreading north. The recommendation is to dispose of infected cattle after clinical recovery and before biting insects make their appearance in the spring.
5. Swine erysipelas has become well established in some states and mastitis in sows is becoming increasingly important.
6. Community sales are still a problem and need more control.
7. The feeding of raw garbage is very much on the increase and is responsible for the spread of swine diseases.

Meat and Milk Hygiene

The committee on meat and milk hygiene recommended as a minimum equipment for slaughter houses:

1. A safe water supply.
2. Means for safe disposal of waste.
3. Equipment for the handling of meat in a sanitary manner.
4. Protection against vermin.
5. Adequate cooling facilities.
6. Inspection approximating that of the federal government.

For the promotion of better milk hygiene the general adoption of the U. S. Public Health milk code an ordinance was recommended for municipalities and counties not already having comparable milk control regulations.

The Task of Restocking

The estimated decline of live stock in enemy occupied countries, as a consequence of lack of feed supplies, requisitioning and slaughter, is 11 million cattle, three million horses, 12 million swine and 11 million sheep.—*Meat and Wool.*

★ ★ ★ BUY WAR ★ ★ ★
STAMPS AND BONDS

Control of Mastitis

All cows that have a history of mastitis during a lactation period, should be treated (with udder injections) during the dry period regardless of apparent recovery from the attack. All four quarters should be injected during the dry period even though only one or two quarters produced abnormal milk.

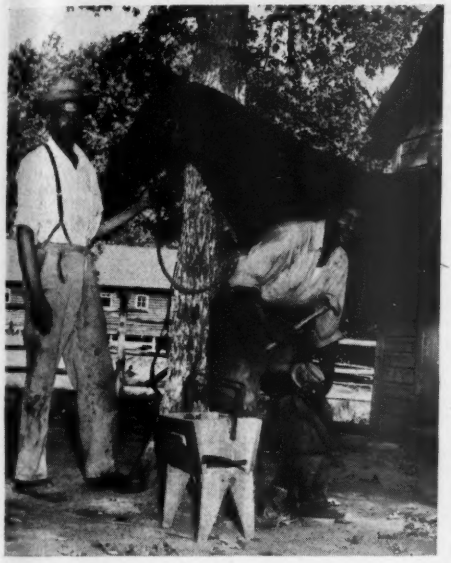
In herds where there is a high incidence of mastitis the same procedure should be followed—treat all cows during the dry period. It will save time in eradicating the disease from the herd. It is understood, of course, that udders that have suffered extensive and irreparable injury should not be treated at all, but eliminated from the herd.—*R. C. Klussendorf.*

The Veterinarian's Duty in Standardizing Dairy Inspection

The veterinary profession of the United States supplies a well organized and efficient veterinary service. Veterinarians have demonstrated the value of veterinary medicine to society as a whole in protecting man from transmissible animal diseases. Every state board of health should have a veterinary member for counsel, for this if for no other reason. It is the duty of the veterinarian to challenge the manner in which present dairy inspection is carried on throughout the country, and to demand the standardization of dairy inspection which, at the present time, is largely in the hands of an untrained personnel and is conducted in a haphazard and for the most part inefficient manner. Food and milk inspection is one of the undeveloped fields of veterinary science in the United States.—*W. H. Martin.*

Mounted Guard at Pine Bluff Arsenal

Trained at Pine Bluff Arsenal, Ark., to the Army style of riding, "Western" men born to the saddle and former members of cavalry troops mount their splendid horses each day and patrol the outer boundaries



The best methods of horseshoeing are employed

and outlying districts of the arsenal area. Behind the scenes, the efficiency of these military police is maintained through the care given their horses by the veterinary officer and the post quartermaster at the Army Service Forces installation.

These well-mounted M.P.'s perform essential duties at the Chemical Warfare Arsenal, checking fence lines, reporting grass and wood fires, chasing off cattle which have breached the fences, reporting the presence of any chemical odors, keeping their mounts fit to go, etc.—all vital to the war effort. At the stables emphasis is placed on preventive medicine and careful supervision of animals. Through careful observation of the animals, the veterinary officer, Major Tom Evans, is enabled to recommend measures to aid in preventing injury or sickness. Sick call, for sick or injured horses, is held each day by the veterinary officer but emphasis on preventive measures has reduced greatly the need for medical treatment.

Stable management consists of supplying plenty of clean drinking water, good feed and proper adjustment of equipment. Fresh water is piped to the stables. Each horse is fed 14 pounds of hay and eight pounds of oats per day. If a horse becomes too fat, the amount of hay is increased and the oats cut down.

Pine Bluff Arsenal's horseshoer, Gilbert Calhoun, takes unusual pride in his work which, he admits, has improved as he followed suggestions from Major Evans. Horses are shod about once a month. In order to save metal, the blacksmith puts new calks on the shoes and reuses them. Care is

Major Tom Evans, Station Veterinarian, Pine Bluff Arsenal

taken to see that they fit and are level so that the animal has a good "standing." Such adjustment may prevent sore muscles and keep a mount from causing injury to himself—if one side of one shoe is built up

the animal's gait can be changed so that he cannot injure himself as he walks.

The saddler, Pfc. Reuben A. Patton, of the M.P. detachment, repairs all saddles and equipment as well as checking adjustments, under direction of the veterinary officer, so as to prevent saddle sores and bruises.

Proper stable management, checking equipment and eternal vigilance keep government horses at Pine Bluff Arsenal fit for any duty for which they may be needed.

Veterinary Service at an Air Field

When a soldier at the Army Air Forces Training Command radio school at Scott Field, Illinois, sits down to mess, he has the same confidence that he's protected against germs in his food as he has in the armour of his Flying Fortress which has proved so impregnable against the Zero. For today, standing guard between him and the ever possible danger of infection in foods of animal origin, is the Army Veterinary Corps.

Foods of animal origin include meat, fish, poultry, sea foods, milk and other dairy products, eggs and canned food stuffs containing meat. Before these foods find their way into a mess hall, they are subjected to the most rigorous tests, including antemortem inspection, post-mortem inspection, inspection prior to purchase, inspection when the food arrives at Scott Field and again when it is issued to the troops. Food in government warehouses receives periodical inspections and inspections just prior to shipment and, of course, upon receipt at an army post and again when sent to the mess hall.

For dairy products including fluid milk, butter, cheese, ice cream, condensed milk, powdered milk, cottage cheese, etc., there is an inspection of the farms where the products are produced, the plants where they are processed and the products themselves before purchase and a further inspection of the products for condition and quantity when they reach the Army. Daily checks of the condition in storage at the warehouse, inspection at the time of issue to the organization and inspection in cooperation with the post medical inspector after the products are in the squadron refrigerator complete the supervision of dairy products from the farm to the soldier's dining table.

Major Evans constructed these stocks from salvage materials

So far as fresh milk is concerned, there is a sanitary inspection of the dairy at least once a month and of trucks delivering the milk at least weekly. Samples are collected weekly for bacterial counts, butter fat, specific gravity, sediment and phophatase tests. There is, also, a daily check for dirty bottles or foreign material in bottles on delivery to the messes.

Each lot of eggs is inspected at purchase and again when it reaches an Army organization. If more than an insignificant fraction of inedible eggs are found, the entire shipment is rejected or the contractor may be permitted to re-candle it and eliminate the eggs that are below grade, when the remainder of the consignment will be accepted.

The veterinary detachment is responsible to the post surgeon in matters concerning

the health of the troops, which of course includes food inspection, and serves mainly in an advisory capacity to the Quartermaster sales officer who purchases the food. No food product of animal origin is paid for by the Army until a veterinary officer has signed a receiving report which states that the food conforms to contract requirements.

Soldiers in the veterinary service have no set hours of duty as have most other soldiers. Veterinary personnel, either commissioned or enlisted, may be on a milk truck at 3:00 a. m. or in a mess hall at noon, inspecting and double checking, or at night they may be watching the clean-up operations by the swing shift in a milk pasteurizing plant.

The veterinary officers at Scott Field are Capt. M. L. Nelson, formerly of Arkdale, Wis., and Capt. B. J. Elliot, formerly of Columbus, O.; Sgt. W. E. Peters, formerly of Belleville, Ill., is the non-com in charge.

More than once, a new radio student proud of his new Air Force insignia, has stared at the inspectors with a puzzled expression.

"What," he always asks, "is a veterinarian doing in the Air Force?"

To this Sgt. Peters has a stock answer—"Inspecting the flying red horse, son."

Veterinary Medicine in Japan

From the utilitarian point of view, the quality of veterinary education in Japan is subordinate to the place and status provided for those it qualifies.

The number of veterinarians in Japan is extremely high compared with the domestic animal population. In 1900, there were 4,248 practitioners and these have been increased gradually in accordance with needs. The chief of the livestock sanitary service is a veterinarian ranking as major general. The directors of animal husbandry and the stallion depots also are veterinarians. Japan maintains two veterinary schools for the civil service and a veterinary military academy. Baccalaureate degrees are conferred upon the graduates of veterinary colleges, and doctorate degrees to those who make important contributions to the science. Before the war the head of the veterinary corps of the army was a colonel and under him were four majors, 20 captains, and 33 lieutenants for each army corps. Others were attached to the remount service, the military academy and the school of horseshoeing. To supply replacements 20 students were admitted annually into the academy. Professors Muto and Nitta, prominent figures in the world veterinary circles, have, since 1921, published the *Journal of the Japanese Society of Veterinary Science*. Its articles, in Japanese, are summarized in German, English and French. For the new régime of Manchukuo where domestic animals (cattle, horses, swine) are abundant, an elaborate sanitary service was established, comprising experiment stations and vaccine laboratories.

The Veterinary Service of the Future

If the control of animal diseases is as important as we believe it is, the veterinary practitioners of the future will be subsidized by public funds in regions where the income from private practice is not sufficient to attract thoroughly qualified men. Already in some states private practitioners are employed for the public service in such a way as to add somewhat to their earnings. As a source of revenue sufficient to invite the attention of the type of men now coming out of the veterinary colleges, this service is still too sketchy and insecure.

War and the Spread of Epizootics

Surra did not occur in Mauritius, a small island in the Indian Ocean, until September, 1901. Up until that time the island had imported its supply of cattle from Madagascar. With the outbreak of the Boer War, the high price of cattle in South Africa attracted the Madagascar trade and a cargo of bullocks from the littoral of the Persian Gulf were imported into Mauritius. Surra imported with these bullocks spread throughout the island killing 5,000 cattle and 4,000 horses and asses within two years. The epizootic was not brought under control till 1922 and the disease has not even yet been wholly eradicated from the island.

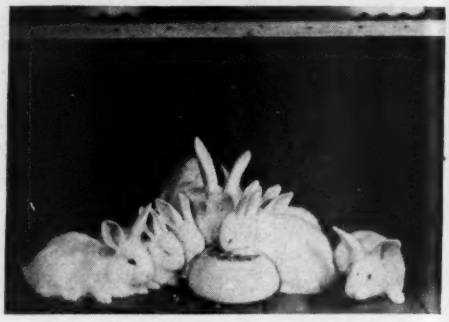
An Impetus to Rabbit Raising

Commenting on the suggestion of recent date of Food Administrator Wickard to "raise rabbits in your back yards," officials of the Fish and Wildlife Service, U. S. Department of the Interior state that rabbits are now being raised by the millions in every state and in every climate. Wherever poultry raising is permitted rabbits may be kept. Many cities and towns are removing restrictions on back yard raising of chickens and rabbits.

In the Los Angeles trade territory the number of rabbits raised has increased tremendously during the past few years. It is estimated that between 6½ and 7 million pounds of rabbit meat was consumed in Los Angeles in 1942. In many western states where large rabbitries are maintained rabbit meat is served regularly in hotels and restaurants.

Rabbits as Meat Producers

Rabbits are consumed for food to a considerable extent in many countries. When the price of meats in general is high, this species of animal is apt to play an important part in the supply of meat. The average consumption of rabbits throughout the world is rapidly increasing and their meat now constitutes a noteworthy commercial product. According to Bentel, before the war the daily consumption of rabbits in Paris amounted to 10,000, and in London to 75,000. According to Schlieger, rabbits to the value of 80,000,000 to 90,000,000 francs annually were raised in France, and Paris alone annually consumed rabbits valued at $1,200,000. In France, England, Belgium and in some parts of Holland, rabbits are not a general food of the people, but rabbit meat may be found daily on the tables of the rich. According to Schlieger's calculation, a breeding farm in France which produces 600 rabbits monthly, weighing 6½ pounds each, affords an annual, clear profit of $1250.—*Edelmann's Meat Hygiene.*



Rabbits Cheaply Fed

R. B. Thompson of the Oklahoma A. & M. College, finds that turkeys and rabbits produce a pound of meat on less pounds of feed than many other meat animals and that rabbits, especially, produce it quite inexpensively. A White New Zealand doe of about 10 pounds, under good sanitary conditions, will average seven to eight young to each of four litters a year.

One such doe will kindle enough young rabbits (figuring seven to a litter) which when weaned at fryer age will amount to 112 pounds of fryers allowing four pounds to each fryer. A pound of fryer can be produced on four pounds of feed which may be composed of hay, grass, vegetable trimmings, garden waste and table scraps.

Recent Developments of Public Health Significance in Some Diseases of Domestic Animals*

MARTIN M. KAPLAN†
Waltham, Massachusetts

THE accelerated tempo of biological research compresses great advances in knowledge into relatively short spaces of time. Because of the vastness of the veterinary field it is impossible for veterinarians to keep abreast of all of the latest advances in our profession. One can only stand in awe of the sanguine demands commonly made upon veterinarians, which may range from the correction of a nystagmic pekinese to an immediate answer as to the number of teeth in an elephant. Be that as it may, there is one phase of veterinary medicine which necessitates our unflagging attention if we are to adequately fulfill our social responsibility. This aspect is that of disease transmission from animals to man.

Any discussion concerning animal diseases must suffer because of an acute, yet remediable, deficiency in veterinary knowledge in the United States—the lack of accurate veterinary vital statistics. Information concerning the incidence and prevalence of specific diseases adds a third dimension to an otherwise constricted picture. The insistence upon continuous improvement of human vital statistical data by medical authorities is well based upon the considerable advantages such information has given in the past. For example, an epidemiologically correct conception of cholera, measles and typhoid fever was gained before Pasteur's time because men like Snow, Panum and Budd combined accurate statistical data with keen clinical observation. If we are ever to emerge from the quicksands of estimates we must reinforce epizootiological knowledge with more accurate statistics. The practitioner can best contribute by a more conscientious reporting of veterinary communicable diseases than has heretofore been his custom. Because of their immediate relation to public health, we are particularly remiss in our duty if we fail to note and report animal diseases transmissable to man.

The number of diseases and parasitisms of domestic animals directly or indirectly transmissable to man runs well over 60. Fortunately, many are exotic diseases, but there are 10 of this group that deserve close attention in this part of the country. A detailed consideration of them would extend this treatise to undue length. The few presented will be only briefly discussed.

Rabies

It usually requires a rabies outbreak, such as the District of Columbia is now experiencing, to set the pot boiling over this ever menacing problem. England has set an example in demonstrating that concerted action on the part of local and national authorities is capable of eradicating this disease. The lack of adequate and uniform laws and the laxness of enforcing present rabies regulations in this country accounts for our continuing failure in dealing with this disease. The elimination of stray dogs and cats and the proper restraint of these animals outside the home, would go far in eventually controlling rabies. Meanwhile, we are marking time with subsidiary measures such as prophylactic vaccination and treatment of bite wounds.

The experiments of Leach and Johnson verify the prophylactic efficacy of rabies vaccine in dogs.[1,2] The degree of protection gained appears to be dependent upon the amount of killed virus injected. We have an analogous situation in the vaccination against equine encephalomyelitis. When the formalized equine brain tissue vaccine was used, results were far from satisfactory. Only when large amounts of virus were cultivated in the chick embryo did we obtain a highly efficient product. The reliance upon one inoculation of rabies vaccine for prophylactic purposes, as is widely practiced at present, provides an unnecessary

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risk. The Army Veterinary Corps uses one to three inoculations at weekly intervals, depending upon the size of the dog, a procedure which should be more widely adopted.

RABIES

A recent study of rabies virus inoculated into guinea pigs, in a manner as closely as possible simulating dog bites, revealed an interesting fact.[3] It has been the custom to advise cauterization of bite wounds with fuming nitric acid. Many physicians and veterinarians hesitated to use this drastic procedure because of the resultant tissue injury and subsequent scarring. The investigations on guinea pigs revealed that a washing out of the wound with a 20% liquid soap solution gave as much, if not slightly better, protection than cauterization with fuming nitric acid. Thus protection was achieved and tissue injury minimized.

Leptospirosis

Human leptospirosis is ordinarily caused by *Leptospira icterohemorrhagiae* which has been shown to be harbored by, roughly, between five and 40% of the urban rat population in the United States.[8] Because of their susceptibility to natural infection cats, swine and horses must be included as reservoirs of the organism. *Leptospira canicola,* the species most commonly found in dogs, is a less pathogenic organism in man than is *L. icterohemorrhagiae*. However, two *L. canicola* human infections recently reported[9] may indicate that the increasing awareness of this disease on the part of physicians will reveal hitherto overlooked cases.

Apparently the experience with leptospirosis in human medicine parallels that of veterinary medicine, *i.e.*, "Seek and ye shall find." Our own observations reveal canine leptospirosis to be fairly common in this region. We have based our diagnosis on a combination of clinical symptoms, rapid agglutination tests, darkfield examinations of urine and specially stained kidney tissue sections. The difficulties for the practitioner of diagnosing leptospirosis in dogs can be somewhat lessend by coupling suggestive clinical symptoms with a proper interpretation of the rapid agglutination test, utilizing the commercial antigen now available. Blood agglutinins often may be detected early, but negative findings should not be given too much weight until at least two weeks have elapsed from the inception of the disease. In using the commercial antigen, a positive agglutination reaction in a 1 to 10 dilution of the blood serum should not necessarily be considered a leptospira infection because many false positives have been found with this dilution in apparently normal animals. Agglutination of a 1 to 100 and 1 to 1000 dilution of the blood serum is good evidence of leptospirosis, although the positive reaction may be due to past infection rather than current disease.

The vehicle of transmission of this disease is the urine. Frequent washing of the hands with due precaution not to touch the eyes should be practiced when handling infected animals. If recovery of the dog ensues, it is advisable to insure an acid urine for at least two months by means of drugs or diet since an acid medium is inimical to leptospirae.

Tularemia

Infected rabbits provide the common source of this disease for man. It is less well known that dogs and cats may contract tularemia and serve as reservoirs of infection.

Shaffer[10] has reported human cases, con-

Tularemia has been induced in domestic rabbits by inoculation

tracted from domestic cats. Cat bites more commonly cause infection than scratch wounds. Inoculation of *Pasteurella tularense* cultures into kittens and cats may produce typical buboes and ulcers, but natural infection does not seem to cause any striking symptoms. Agglutination tests are relied upon to determine infection in these animals.

Several cases have been reported recently of hunting dogs that have contracted tularemia naturally.[11,12,13] Frequently the disease is so mild as to be inapparent, and detectable only by means of an agglutination test. In clinically manifest cases canine tularemia may assume an acute or chronic course. In either type progress is unsatisfactory and euthanasia is usually invoked. The acute form presents a high temperature (106°F.), swelling in the region of entry of the organism, dyspnea, depression and dehydration. Post-mortem examination may reveal small abscesses dispersed throughout the internal organs, especially the spleen. The chronic type of the disease includes symptoms of a progressive loss of weight over a period of two to four weeks; the appearance of nodular subcutaneous swellings which point and rupture yielding a thick, tenacious amber pus; opacity of the cornea with a purulent conjunctival exudate, particularly if the eye has served as a portal of entry; chills, and muscular soreness.

Pasteurella tularense is capable of penetrating the unbroken skin and conjunctiva so that suspected cases should be handled with gloves, figuratively and literally.

Equine Encephalomyelitis

The disastrous outbreak of equine encephalomyelitis that occurred in Massachusets in 1938 which resulted in 38 human cases with 25 deaths, and 248 equine cases reported with over 90% mortality,[17] made veterinarians in this region acutely conscious of this disease. A precipitous decline

Anti-encephalomyelitis vaccination

in incidence among horses has taken place in the last five years. However, known facts that concern the epizootiology of equine encephalomyelitis bid us not to relax our vigilance. The ability of mosquitoes[18,19] and ticks[20] to transmit the virus combined with the findings that wild and domestic fowl serve as reservoirs of infection[21,22,23,24] should serve as constant pincers against complacency.

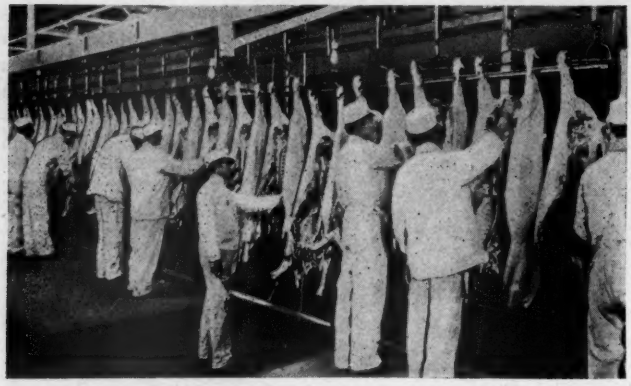
As veterinarians we can lessen the danger to human beings by urging annual intradermal vaccination of horses with the effective chick embryo vaccine. The isolation of the western strain of the virus as far east as Alabama, and the eastern strain as

far west as Texas and Michigan[25] indicates that the use of the bivalent (eastern and western strains) vaccine should supersede vaccinations with a univalent product. The Army adopted this procedure two years ago.

Salmonelloses

At least 29 types of *Salmonella* found in various animals have been isolated from infections in man.[4] These animals include swine, horses, cattle, sheep, dogs, cats, chickens, turkeys and pigeons. Fortunately, salmonellosis in man is not usually a serious disease, but occasionally a severe infection occurs and death may result. Statistics of the Massachusetts Health Department concerning the species of *Salmonella* involved in food-borne outbreaks from 1930 to 1942 revealed that the most commonly incriminated organism was *S. typhi murium*,[5] a species found in all our domestic animals.

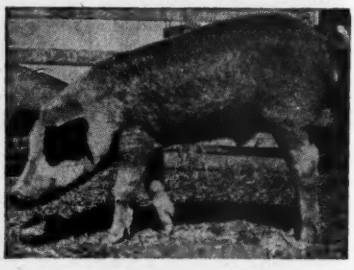
The veterinarian often serves as the first line of defense in preventing the spread of *Salmonella* infection to man. The local veterinarian who is employed to pass upon meat in slaughter houses not under the supervision of the federal Meat Inspection Division should be on the alert to reject meat from animals showing post-mortem lesions of paratyphoid. Diarrhea in all animals should be considered as a potential hazard to human health unless it is certain that the *Salmonella*, or other organisms pathogenic for man such as *Endameba histolytica*, *Balantidium suis*, etc., are not involved.



Meat from animals showing post-mortem lesions of paratyphoid should be rejected by the veterinary inspector

Erysipeloid

There is growing reason to believe, but still not definite proof, that swine erysipelas is present in Massachusetts. Van Es[6] and Klauder, *et al.*[7] have recently reviewed *Erysipelothrix rhusiopathiae* infection in man. Klauder, *et al.*, reported an infection in a butcher who died of the disease. It is interesting to note that the post-mortem examination revealed a verrucose endocarditis similar to that seen in the chronic type of the disease in swine. Ordinarily the disease remains localized in human beings. Nevertheless, it is capable of incapacitating a person for two to four weeks, and the possibility of generalized infection is always present.



Post-mortem examination of the disease in a man showed verrucose endocarditis similar to that sometimes seen in the chronic type in swine

Veterinarians, farmers and slaughter house workers should take adequate precautions wherever erysipelas is suspected in swine. Skin abrasions or cuts on the hands provide the usual portal of entry in man.

Rocky Mountain Spotted Fever

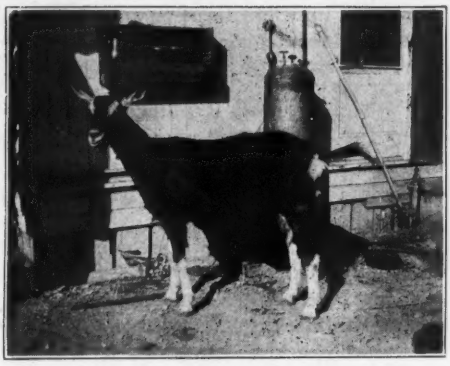
Rocky Mountain spotted fever has been reported in nearly all of the states, including Massachusetts. The role of the dog as a reservoir of the causative organism, *Rickettsia rickettsi*, is too frequently shunted to the background as being of little moment. The same organism causes *fievre boutonneuse* (Mediterranean region), Kenya fever (Africa), and Sao Paulo typhus (Brazil), with the dog probably serving as the common reservoir.[26] In Brazil[27] *R. rickettsi* was isolated from the blood of 31 seemingly healthy dogs which were household pets where Sao Paulo typhus had occurred.

The apparent biological adaptation between *R. rickettsi* and dogs does not favor clinical recognition of diseased animals. Badger[28] inoculated puppies and older dogs with *R. rickettsi*. The organism was isolated from the blood stream at two-day intervals for six days following inoculation, but was unrecoverable thereafter. The older dogs showed no clinical symptoms. Puppies manifested symptoms of a mild coryza with coughing, after a seven-day incubation period. No deaths resulted, and the recovered dogs were refractory to attempted reinfection 29 days after the first inoculation. Thus, specialized laboratory procedures such as guinea pig inoculation, or a Weil-Felix (Proteus OX 19) reaction are necessary to definitely determine infected animals.

Three of the common dog ticks found in the United States, namely, *Dermacentor andersoni, D. variabilis*, and *Rhipicephalus sanguineus* are capable of transmitting pathogenic rickettsiae. "Ticky" dogs should not be tolerated. The potential danger to veterinarians and dog owners of deticking infested dogs can be mitigated by practicing a few precautionary measures. Instructions as to the use of rubber gloves and forceps, taking care to avoid crushing the ticks, should be explained to dog owners. The tick usually requires a four to eight hour feeding period to transmit infection to man through bites so that in highly infested areas daily examination of the body, especially the hairy portions, is advisable. A thorough washing of the hands with soap and water, followed by an alcohol rinse, should be performed after handling ticks.

Staphylococcosis

The ingestion of a preformed, heat stable toxin in food contaminated with certain strains of staphylococci is one of the commonest causes of "food poisoning" in man. Since the staphylococcus is a ubiquitous organism, it is believed that the contaminated food usually acquires the organism



Staphylococci appear to be the prime cause in caprine mastitis

from the environment or from a human carrier. That animals can play an important part in staphylococcus toxin poisoning is only too well illstrated by a recent account of two deaths caused by the drinking of milk from a goat which was suffering from acute staphylococcic mastitis.[29]

Our experience with caprine infectious mastitis has shown the staphylococcus to be the prime cause. The only organism found in 22 samples of infected goat milk submitted to us, was the staphylococcus. Recently, we have observed eight goats from two different herds affected with cutaneous nodules, varying in size from that of a small pea to that of a hazel nut, which involved most of the udder including the teats. Most of these nodules had a shot-like consistency. Some of them fluctuated, formed pustules, and ruptured spontaneously. Pure cultures of *Staphylococcus aureus* were obtained from the lesions. We have also found staphylococcic mastitis in cows to be quite prevalent. Of 91 infected milk samples, 61 contained staphylococci, 30 of them streptococci, also.

At present it is impossible to predict toxogenic properties in a particular strain of staphylococcus infecting an udder without

involved laboratory studies. Pasteurization of contaminated milk, if performed early enough, will cut down the danger of toxin formation as the staphylococci will be killed, but it will not obviate the risk of any preformed toxin that may be present. Certainly, all grossly altered milk coming from infected udders should be condemned. The high frequency of latent staphylococcic mammary infection in cows would make it unfeasible to condemn milk coming from otherwise apparently normal quarters.

Psittacosis (Ornithosis)

The discovery of this virus in barnyard fowl and pigeons[14,15] has added new significance to this disease. A survey of pigeons from different rural and urban areas in the United States showed 115 reactors in 237 birds examined in 1942.[15] We must, therefore, disabuse ourselves of limiting the reservoirs of this virus to psittacine and related birds. For the most part, a latent

Ornithosis is sometimes diagnosed range paralysis

carrier status obtains in pigeons and chickens as it does in psittacosis of parrots. (It is interesting that Hammon and Reeves have just reported that the virus of St. Louis encephalitis causes a symptomologically indiscernible virusemia in chickens and ducks which provide a source of infection for the mosquito vector.[16])

Specialized methods needed for an accurate diagnosis make field recognition of affected birds difficult. Nevertheless, psittacosis provides one of the many reasons why veterinarians should familiarize themselves with the neglected field of poultry diseases. It is noteworthy that where this virus was isolated in chickens a diagnosis of "range paralysis" had been made, one which serves too often as a cloak for our ignorance.

Brucellosis

In the last five years 255 cases of human brucellosis have been reported in Massachusetts—a rise of 25% over the preceding five years. This is probably due to a combination of better reporting, more adequate diagnostic measures and closer attention

Brucellosis frequently causes hygroma of the knees in cattle

paid to this disease on the part of physicians, rather than an increasing incidence of the disease itself.

From a public health point of view a good deal of the problem of brucellosis would be solved if adequate pasteurization of all milk was employed. In Massachusetts it appears that we are well on the road toward achieving that end, but until the goal is reached and as long as contact infection involves farmers, veterinarians, slaughter house workers, etc., the public health aspect remains important.

The new brucellosis control program for Massachusetts to be instituted by the Division of Livestock Disease Control depends mainly upon the vaccination of calves and immature heifers with Strain 19 of the organism. Vaccination of open heifers and mature cattle is to be left to the discretion of the local veterinarian.

There is little doubt concerning the ability of calf vaccination with Strain 19 to prevent subsequent abortion from active infection. It is difficult at present to advance a definite opinion concerning vaccination of adult cattle because of the nonuniform results that have been reported in the literature. Future work, utilizing adequate controls, should clarify this important problem. In the meantime, however,

in the control of brucellosis we should not discard adjunctive measures such as parturition stalls, isolation of aborting cattle, terminal disinfection, and quarantine and agglutination testing of new additions.

Conclusion

In the foregoing discussion an attempt has been made to focus attention on some of the important problems pertaining to public health, that are faced by veterinarians in this part of the country. New discoveries will necessitate revision in the methods of attack on these problems. Meanwhile, an intelligent use of our present knowledge will justify the ever growing esteem in which we are held by health authorities.

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Dermatosis of the Ears, Cheeks, Neck and Shoulders in Young Calves*

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AN ECZEMATOID disease occurring in young calves has been reported by dairy farmers of Michigan. The disease usually develops in the fall of the year. It is characterized first by the development of a heavy dandruff and, soon thereafter, a waxy crust, accompanied by loss of hair over the outer surface of the ears. The skin of the affected areas shows swelling and soreness. The crusted areas finally spread over the cheeks, along the crest of the neck and over the shoulders. Generally the disease is static for a time, after which slow recovery usually begins—scales become dry, loosen and fall away. Then new hair develops. In some instances, however, the encrustation spreads over the entire body. A few fatal cases have been reported.

Experimental

Early in October, 1943, a report from a large, purebred dairy farm listed seven cases of this disease in calves 16 to 73 days of age, in a barn housing about 55 animals. The calves were kept in individual pens and the general sanitary conditions were excellent. During the first few days of life the calves were allowed to suckle their dams. The barn feed consisted of a limited amount of whole milk (not more than 4 pounds per head daily), a commercial calf preparation, a grain mixture (corn 2 parts, oats 7 parts, and bran 1 part) and a good grade of mixed alfalfa-brome hay. The hay and grain were kept before the calves at all times. In addition, the calves received 50,000 U.S.P. units of vitamin A (shark liver oil) and 100mg of nicotinic acid a week.

Microscopic examination of affected areas failed to reveal any skin parasites. The calves were treated with an oil base ointment which resulted in some apparent improvement for a few days, after which they reverted to the original condition.

Preliminary studies of the blood revealed exceedingly low plasma ascorbic acid values.[1] Therefore, regular determinations of blood ascorbic acid values and varied treatments were begun on seven diseased and two normal calves. The equipment for blood plasma ascorbic acid determinations was taken into the barn and determinations made immediately after the blood samples were drawn.

Results and Discussion

As is evident from the protocols and table, the eczematoid condition gradually disappears as the animals become older and some of the calves listed (1039 and 1041) were already beginning to recover when the experimental studies were instigated. The condition had been much more severe in one calf (1039), as was indicated by observations made earlier and by the high blood ascorbic acid value found on October 11.

The first checking of the spread of the disease in untreated calves occurs when the calves are four to six weeks of age. The severity of the disease then seems to depend on the age of the calf at the time the disease first becomes evident, and the cure depends upon changes in nutritional requirements as the rumen develops. However, the disease may be static for a month or more after its spread has been checked.

Calves 1035, 1038, 1039, 1040, 1041 and 1042 had reached the static condition of the disease or were definitely improving when these studies were begun. Calf 1050 was evidently in the early stages of the disease.

The immediate improvement observed on injection of ascorbic acid in the case of the treated calves indicates that ascorbic acid is intimately concerned with the disease and this is borne out by the extremely low blood ascorbic acid values found in calves 1038, 1040 and 1042.

Recovery was much more rapid in the

*Michigan State College Agricultural Experiment Station Journal Article No. 685 (U. S.).
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††Animal Pathology Section, Michigan State College.

[1] Mendlin, R. L., and Butler, A. M., *J. Biol. Chem.* 122:673, 1938.

case of the treated calves (1038, 1039, 1040 and 1050) than in the case of the untreated calves (1035, 1041, 1042).

Lindquist and Phillips[2] have indicated that ascorbic acid synthesis in the calf probably begins between the second and third week of life. That this beginning of synthesis, to any marked degree, can be greatly retarded under certain conditions is indicated by the plasma findings on calves 1038, 1040 and 1041, which were 65, 59 and 59 days old at the beginning of the experiment, and show plasma ascorbic acid values of 0.09, 0.07, and 0.08mg % respectively.

Lindquist and Phillips[2] found that feeding ascorbic acid had little effect on the plasma ascorbic acid after the 10th day. Because a preliminary injection of a large dose of ascorbic acid (3gm) was used, it is difficult to interpret our results on feeding ascorbic acid and chlorobutanol. All the beneficial effect may have been due to the single large injection of ascorbic acid. However, calf 1050 showed a definite drop in plasma ascorbic acid when the acid feeding was discontinued for a few days. The calf was then 36 days old. The calves fed chlorobutanol had reached a considerably higher peak in plasma ascorbic acid November 4, than the calves receiving ascorbic acid.

The following protocols are indicative of the experimental observations and findings:

Untreated Calf 1042—Born August 15, 1943

Oct. 11, 1943—BP. Asc. A. 0.08mg %. Severe dermatosis of ears, cheeks, upper longitudinal half of neck and over the shoulders.

Oct. 18, 1943—BP. Asc. A. 0.11mg %. No evident improvement.

Nov. 4, 1943—BP. Asc. A. 0.34mg %. Some improvement, but the scale was waxy and clinging to the skin. Removal caused bleeding.

Nov. 23, 1943—BP. Asc. A. 0.45mg %. Ears still thickened, the scale damp, waxy and clinging to the skin. Some hair was coming through the scale. Calf was unthrifty in appearance. The scale covered a somewhat smaller area than earlier, but was still heavy and tight over the shoulders.

Dec. 20, 1943—Heavy scale had disappeared. A large amount of coarse dandruff was present. The hair coat was coarse and rough and the calf presented an unthrifty appearance.

Normal Calf 1021, Born June 21, 1943 (not treated)

October 11, 1943—Blood plasma ascorbic acid, 0.38mg %.

October 18, 1943—Blood plasma ascorbic acid, 0.30mg %.

November 4, 1943—Blood plasma ascorbic acid, 0.34mg %.

November 23, 1943—Blood plasma ascorbic acid, 0.37mg %.

No evident dermatosis throughout experiment.

[2] Lindquist, N. S., and Phillips, P. H., *J. Dairy Sci.* 26:1023, 1943.

TABLE I.—BLOOD ASCORBIC ACID VALUES AND SEVERITY OF DERMATOSIS

Calf No.	10-11-43 Age (days)	10-11-43 "BP.Asc.A" Mg.%		10-18-43 "BP.Asc.A" Mg.%		11-4-43 "BP.Asc.A" Mg.%		11-23-43 "BP.Asc.A" Mg.%		12-20-43
		NORMAL								
1021	133	0	0.38	0	0.30	0	0.34	0	0.37	0
1022	131	0	0.24	0	0.37	0	——	0	0.51	0
1046	30	0	0.28	0	0.27	0	0.28	0	0.46	0
		UNTREATED (DISEASED)								
1035	73	++	0.25	++	0.45	++	0.48	+	0.51	0
1041	59	§	0.29	§	0.39	§	0.42	0	0.55	0
1042	59	§§	0.08	+++	0.11	++	0.34	++	0.45	+
		TREATED (DISEASED)								
1038	65	§§	0.09*	+++	0.36**	§	0.48	0	0.28	0
1039	62	+	0.41*	§	0.31**	§	0.67	§	0.28	0
1040	59	#	0.07*	+++	0.14†	§	0.32††	0	0.39	0
1050	12	§	0.07*	§	0.34†	§	0.17††	0	0.30	0

* 3 Grams ascorbic acid injected October 11, 1943.
** 1 Gram chlorobutanol in feed daily until November 8, 1943.
† 1 Gram ascorbic acid in feed daily until November 13, 1943.
†† No ascorbic acid from October 27, 1943 to October 31, 1943.

0—No dermatosis.
§—Questionable dermatosis.
+—Mild.
++—Moderate.
+++—Moderately severe.
§§—Severe.
#—Very severe.

Treated Calf 1038, Born Aug. 9, 1943

Oct. 11, 1943—Blood plasma ascorbic acid, 0.09mg %. Advanced dermatosis of ears, cheeks, upper longitudinal half of neck and over shoulders. Subcutaneous injection of 3 grams ascorbic acid.

Oct. 18, 1943—BP. Asc. A. 0.36mg %. Dermatosis had begun to clear. Started feeding 1 gram daily of chlorobutanol.*

Nov. 4, 1943—BP. Asc. A. 0.48mg %.

Nov. 23, 1943—BP. Asc. A. 0.38mg %. The animal had developed a new hair coat and only two spots of desquamating epithelium about the size of a ten-cent piece were evident.

Dec. 20, 1943—The animal had completely recovered.

Summary and Conclusions

As shown, calves 1038, 1039, 1040 and 1050 received an initial subcutaneous injection of 3gm of ascorbic acid, which resulted in an ultimate rise in blood plasma ascorbic acid and a corresponding improvement in the dermatosis. In this data it is difficult to evaluate the effects of feeding chlorobutanol and ascorbic acid. However, after several days of feeding chlorobutanol, calves 1038 and 1039 had the highest levels of blood plasma ascorbic acid, and 1038 at least showed the greatest degree of recovery. Also, calf 1050 showed a definite drop in blood plasma ascorbic acid when taken off the ascorbic acid feeding for five days but showed an increase when feeding was resumed.

Calf 1042 made a natural recovery, but recovery was slow and the animal failed to grow at a normal rate. The hair coat was coarse and rough and the calf presented an unthrifty appearance after the treated animals had completely recovered.

A dermatosis of young calves has been observed under barn feeding conditions. The disease is accompanied by exceedingly low blood plasma ascorbic acid values and responds to ascorbic acid therapy.

*Chlorobutanol discontinued November 8, 1943.

✓ ✓ ✓ ✓

The basic training given the veterinarian has placed him in the position that he may, with slight additional specialized training, become the one best equipped to handle milk control work. When the veterinarian has had such specialized training, he is the best equipped person to conduct or supervise the complete control over food products of animal origin. This fact is recognized by the Army and should be so recognized by our civil governments as well.

✓ ✓ ✓ ✓

It is strange but true, that practitioners of all times (as history shows) have been the poorest judges of what is and what is not "practical" for themselves. Digging into the unknown for future edification has been denounced always by the thoughtless clinician, doting only on his art. . . . In the 90's, discourses which led to an effective method of eradicating tuberculosis from the cattle of a great nation were not thought practical. Ten years later, the idea that swine practice might constitute a useful service was ridiculed. It was "impractical" to study the differential diagnosis of swine diseases. —*Veterinary Military History of the United States.*

✓ ✓ ✓ ✓

What's in a Name

The reason why the name is changed after slaughter and when a carcass becomes food is found in an historical event of the year 1066 when the Normans, led by William the Conqueror, conquered what is now England. As they were French, the French language became the official language of the court and of the ruling classes.

However, the Anglo-Saxons (the original inhabitants) many of whom were servants of the conquerors, kept on using their own tongue. They had the care of the live animals which they called by the Saxon names such as ox, cow, pig, calf, sheep, deer and so on.

The meat was mostly eaten by the French masters so was given French names. The Saxon servant called a sheep a sheep, the Frenchman called it mouton. An ox was boeuf, and so on. The names have remained and that is why the carcass is called by a different name.—*The Humane Review.*

Emergency Poultry Disease Prevention†

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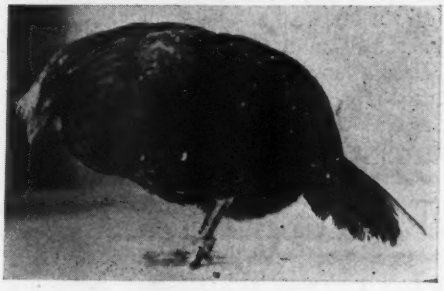
BY NOW it is quite generally known that extraordinary demands for higher production have been made of the poultry industry. Briefly the demand amounts to this: "Produce more with less"—less labor, less equipment, less and poorer feed, inadequate transportation and so forth. In spite of the numerous impedimenta placed in his way the poultryman has succeeded remarkably well in producing more eggs and more meat.

The extra efforts necessary for this increased production and the various restrictions imposed on the industry have naturally contributed to the aggravation of the disease problem. While the disease situation is not as serious as might have been expected, there is plenty of room for improvement. The question is: What can we as a profession do about it? In order to suggest some things that we might do, I shall briefly review the disease situation for the year and then offer suggestions for added efforts along the line of prevention and treatment as far as our present knowledge will warrant.

Fowl Cholera and Fowl Typhoid

Fowl cholera and fowl typhoid have not been encountered in Michigan during the past 10 to 15 years. From Kansas we learn that these two diseases have now reappeared in that state after a lapse of 10 years. Dr. Robert Graham informed me by letter, late last fall, that fowl cholera had been diagnosed in Illinois, also after a lapse of some time. Since these diseases have reappeared in Kansas and Illinois, there seems to be no particular reason why such a thing may not happen in Michigan. Therefore, it behooves us to be on the lookout for them; not that we can do so much in treating them specifically or applying spectacular preventive measures, but that we may be able to guide poultrymen as safely and painlessly as possible through such experiences. Fowl cholera and so-called pullet disease show very similar symptoms, and when a cholera-like disease appears an effort should be made to obtain a reliable diagnosis. This may require a laboratory examination.

Poultry remedy manufacturers commonly recommend two things to be done for these diseases (cholera and typhoid): 1. Protective vaccination and 2. Medication through drinking water or feed or both.



Fowl Typhoid

I don't believe that protective immunization with mixed bacterins can do much good, especially when not more than one dose per bird is given. If there is any merit in this method of treatment, it seems that at least three doses, given at five to seven-day intervals, would be required. Due to the usually acute course of these diseases curative immunization is obviously hopeless. I know of no evidence to show that medication through the feed has any value. Medication of the drinking water might be worth while as a means of preventing or reducing the spread of infection through water. Chlorine preparations are best suited for this purpose. Enough should be added so that the water will contain 50 to 100 parts

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†Read at Michigan Short Course for Veterinarians, Jan 26, 1944.

per million of available chlorine. Such treated water must be changed twice a day because of the evanescent nature of chlorine. Obviously due attention must be given to prompt removal of affected birds as well as to cleaning and disinfection of quarters.

Pullet Disease

Suggestions for the diagnosis, control and treatment of pullet disease will be found in the July, 1942, number of VETERINARY MEDICINE. This disease is very prevalent in several parts of the country including Michigan, and must not be confused with cholera or other well known acute infectious diseases of poultry, which it may resemble rather closely with respect to symptoms.

Pullorum Disease

Pullorum disease was somewhat more prevalent last year than during previous years. This was no doubt due to the increased demand for chicks which, in turn, caused a let-down with respect to pullorum disease prevention. It seems certain that the idea that pullorum disease does not spread among adults is wrong. Bacteriological examinations show that *Salmonella pullorum* is often harbored in the oviduct and in the intestinal tract. Therefore, it must be passed out with the droppings and, if it is highly virulent and is picked up in sufficient numbers by susceptible birds, I see no reason at all why it cannot become established in new hosts.

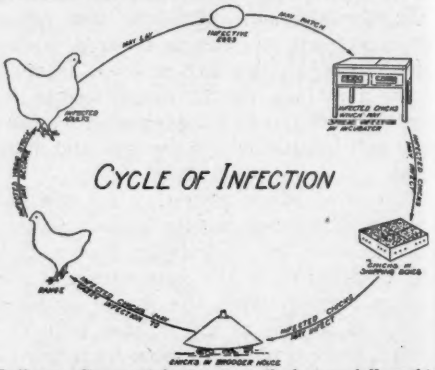
Birds showing symptoms and even gross lesions indistinguishable from pullet disease have been found to have pullorum disease.

Pullorum disease has been increasing in prevalence in turkeys and may cause extensive losses in poults even after they are several weeks of age. The tube agglutination test, as perfected by Hinshaw, is now quite efficient when carefully applied. After the turkey hens come into full production, about the first week in March in Michigan, the test is not satisfactory due to so-called cloudy reactions.

In attempting to control pullorum disease in turkeys as well as in chickens, it is well to realize that the test alone should not be depended upon to eliminate the disease. The surest way to get rid of this costly disease is to get hatching eggs from stock known to be absolutely free from pullorum disease, as judged by the history of the flock and by the flock having been found clean on the first test (tube agglutination test, 1 to 25 serum-antigen dilution*), hatching these eggs in clean incubators in which no eggs other than those from clean stock are hatched, and then raising the chicks or poults on clean premises.

The next best procedure is to test flocks at monthly or six-week intervals until the breeders are found to be clean and then observing the same regulations as are prescribed above.

It must be remembered that even if there



Pullorum disease infection in a flock may follow this cycle. Thhe disease can be eradicated either by breaking the cycle of infection through eliminating the infected birds by means of the agglutination test, or by disposing of the entire infected flock and heplacing it with pullorum disease-free stock

is only a single infected bird in the flock, one must be prepared for an outbreak of pullorum disease in newly hatched stock. The low tolerence idea may be a halting step in the right direction, but one cannot hope for increased resistance in young birds nor immunity to losses just because there are only, say, 1 to 2% reactors in a breeding flock.

One aid to the control of pullorum disease in chicks or poults is careful examination for symptoms of disease at the time of shipment and immediately on arrival at the point of destination. Indications of anything abnormal, no matter what the symptoms may be, must be considered sufficient cause for condemnation and immediate removal of the affected chicks from the rest. This kind of inspection should be continued

*This applies to turkeys.

twice a day until the birds are two or more weeks of age. In the case of turkeys it is well to inspect them in like manner for at least two weeks and then once a week until they are at least six weeks of age.

It should go without saying that custom hatching is usually incompatible with successful pullorum disease control, and that careful incubator and brooder house sanitation is absolutely essential.

Avian Tuberculosis

Avian tuberculosis is much too prevalent in the central northwest. This disease causes not only great losses to the poultry industry but, due to its effect on hogs, it is estimated that 2,500,000 dollars' worth of pork is lost annually.

Naturally infected tuberculous chickens. Note emaciation evidenced by the prominent keel bone

The usual recommendation for the control of avian tuberculosis is to sell off the layers at the end of one year of production and replace the flock with day-old chicks. Obviously this is impossible in the case of high-quality breeding stock. Where birds are kept for eggs and meat production only, it is all right, provided good poultry management in general is practiced to complete this otherwise imperfect system of disease prevention. It is argued that it is economical to allow chickens to run with the hogs so as to enable the birds to eat the corn that passes undigested through the hog's digestive tract. This argument is then used against recommendations in favor of modern poultry houses and proper confinement of poultry within yards set aside for that purpose. We all know that tubercle bacilli will live for months if protected from sunlight. On farms where chickens run free, we find them in the barns, hog houses, toolshed, garage, corncrib, etc. It takes very little power of imagination to realize what a problem avian tuberculosis can become under such conditions. The mere replacement of the flock with chicks may cause the disappearance of most of the gross evidence of the disease but it is highly questionable whether one can hope to rid the place of infection by such a system. In the long run it seems that it will be more economical to establish modern sanitary conditions for the flock in the form of a well constructed house and adequate fenced-in yards or porches.

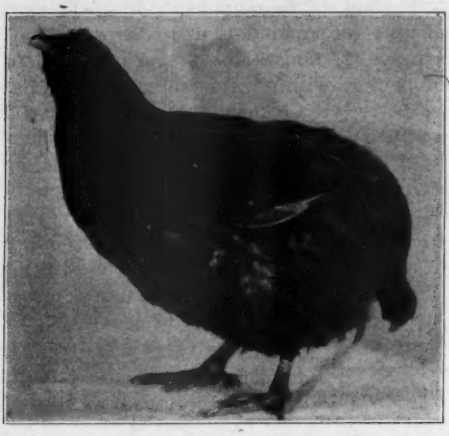
Laryngotracheitis

Laryngotracheitis has not been very prevalent in this state during the past year. However, it is well to remember that vaccination by applying live virus vaccine to the mucous membrane of the cloaca with a brush or a swab is an effective method of prevention, provided the vaccine is active. Unfortunately, the laryngotracheitis virus vaccine loses its potency easily and we must, therefore, be sure to check a representative number of birds for "takes" four to five days following vaccination. Birds not showing takes should be revaccinated. Immunity to laryngotracheitis develops very rapidly, usually in about five days and protects for at least one year.

Vaccination should not be employed in localities where the disease has not been present before, nor where there is any question as to the exact nature of a respiratory disease that might or might not be laryngotracheitis.

In emergency cases it is possible to make a vaccine from scrapings from tracheas of affected birds to be used to vaccinate the rest of the birds in the same flock. Obvi-

ously this can be done only in the earliest stages of an outbreak, and may be done when the time required for securing a commercial vaccine would be long enough to



Hen with Infectious Laryngotracheitis

permit the disease to spread throughout the flock, thus making vaccination useless. Such a vaccine must not be used on other flocks because of the danger of spreading bacterial as well as virus infections.

The Leucosis Complex

Leucosis, popularly known as fowl paralysis, is still the number one disease of chickens in some localities. While we have no diagnostic test or specific treatment to offer for this disease, we know some things concerning it, on the basis of which a few suggestions for preventive measures may be justifiable.

The cause is a filterable agent which evidently is spread through the eggs of infected hens, through droppings, and possibly through blood sucking parasites such as the red mite. Therefore the following recommendations seem to be in order:

1. Cull promptly all birds that show symptoms of leucosis, such as grey eye, blindness, lameness, paralysis of legs or wings, and torticollis.

2. Select hatching eggs from birds that are at least 18 months old, and when possible do progeny testing.

3. Be particularly thorough with respect to such sanitary measures as cleaning and disinfection of houses and utensils and see to it that dropping boards are screened.

4. Employ a rotation system of yards and ranges.

5. Make proper and safe disposal of litter and droppings.

6. Keep the birds free from parasites, especially the red mite.

7. If the flock is of good quality, there is no sense in disposing of it and then replacing it with chicks from another flock. This disease is so wide-spread that it is nearly impossible to get chicks from clean stock. By changing stock one runs the risk of going from bad to worse.

8. Use as much asepsis as is practically possible in drawing blood for the pullorum test.

These recommendations may not be 100% effective, but they can do no harm and may do a great deal of good.

Intestinal Worms

Promiscuous worming of chickens is one of the worst and most widely practiced forms of mismanagement. Many poultrymen seem to think that all young birds must of necessity have worms. Therefore, they give worm remedies regardless of whether they have uncovered any evidence of infestation or not. Most of these remedies are worthless; some are actually harmful.

Remedy peddlers and some "servicemen" use many tricks in inducing poultrymen to buy worm remedies. One of these is to show the presence of cecum worms. These are almost universally present and do very little if any harm. Furthermore, it is nearly impossible to remove them by remedies.

The following sanitary measures will aid in controlling worm infestation.

1. Raise young birds on clean range.

2. Remove all rubbish from the poultry yards, particularly such objects as boards, stones or anything else under which intermediate hosts of certain tapeworms, such as slugs, may hide.

3. Dispose of litter and droppings in such a way that they may not become a source of reinfestation. This may be done by burning, placing in screened manure pits or by hauling such material to fields sufficiently distant from the area on which the flock is kept to make infestation from such a source as difficult as practically possible.

4. Do not allow liquid milk to stand in troughs all day long. Milk attracts flies and flies serve as intermediate hosts for certain tapeworms. Other intermediate hosts are ground beetles, dung beetles, meal beetles and certain ants. Avoid keeping anything around the poultry plant that may attract any of these.

5. If a remedy must be employed use the safest and most efficient one available.

Restraint of a fowl for vaccination. The vaccine may either be rubbed in follicles where feathers have been plucked or the "stab" method may be used

Fowl Pox

During the past year we saw an unusual amount of fowl pox. In some turkey flocks it took on serious proportions, affecting mostly males. During the breeding season this is a serious problem because many of the males become blind. Thus the disease interferes with mating and the result is reduction in the fertility of the eggs.

Losses due to this disease are easily preventable. Both chickens and turkeys can be successfully vaccinated. Chickens should be vaccinated when they are from 6 to 12 weeks of age. If the fowl pox vaccine is used, one vaccination per year will do. In chickens the safest method is the wing web stab method. This method must not be used in turkeys.

When pigeon pox vaccine is used one must employ the feather follicle method and apply the vaccine to about 24 follicles. The immunity produced by pigeon pox vaccine does not last more than three to five months.

This vaccine should not be used for turkeys. Turkeys do not retain their immunity for a full year and breeders must be vaccinated twice. Therefore, all the turkeys should be vaccinated when they are from 6 to 12 weeks old, and the breeders should be revaccinated from five to six months later. We should encourage poultrymen to vaccinate their flocks wherever pox has been prevalent.

Coccidiosis

Coccidiosis was more prevalent than usual, undoubtedly due to the wet weather.

Sub-acute coccidiosis in a four-week-old Single Comb White Leghorn chick. Note the unthriftiness, stunted growth, sleepiness and emaciation

Sulfaguanidine, if used in time, is reported to have given satisfactory results in checking the disease. This drug will inhibit all species of coccidia when given in amounts of 0.5 to 1% in the mash. Medication must be begun in the very first stages of the disease, otherwise it will prove ineffective. The treatment should continue for two weeks. During this time every practical effort possible should be taken to safeguard the birds after the treatment is discontinued.

Diseases of Undetermined or Complicated Etiology

At present and during the fall of 1943 respiratory disease in chickens has been very prevalent. Some of this has had the appearance of coryza (roup or colds). In some flocks there is a complication of some sort, manifesting itself in the form of one or more, often all of the following conditions: tracheitis, bronchitis, pneumonia and air-sac infection. Whether what we are dealing with is one or more disease entities cannot be stated at this time. Dr. C. W. Darby of our department is working diligently on the problem and has made some progress in establishing experimental cases and in collecting organisms from cultures, made from affected birds, which will be used in a study of the etiology of this disease.

Sulfathiazole has been shown by Delaplane and Stuart[1] to have merit in the treatment of simple coryza. From 0.5 to 1% is used in the mash. According to Hamilton[2] this dosage is insufficient. He found that not less than 3.33% was necessary to bring about improvement, and that more was required for recovery. Thus, this treatment may prove too expensive to be practical. So far it has not proved effective in any other diseases of the upper respiratory tract than that caused by *Hemophilus gallinarum*. Unfortunately, other microbes cause coryza-like symptoms. Therefore, unless one knows definitely what the cause is, it is wise not to make too many promises as to the possible success of the treatment.

Neoprontosil has been suggested as a beneficial agent in the treatment of roup. In this treatment 50, five-grain tablets are to be dissolved in one pint of water. From this stock solution one tablespoonful is added per quart of drinking water. Now, what particular form of the roup complex does this drug affect? It can hardly be hoped that one remedy will check equally well viruses and several species of bacteria. It is now known that several viruses and bacteria may cause disease of the respiratory tract. So, here again it may be well to go easy on claims as to the effectiveness of the remedy until more is known about the roup syndrome and the specific effectiveness of this drug.

Disinfectants and Remedies

More attention should be given to scientific application of disinfectants. Many so-called disinfectants are useless and some of them are undesirable due to their objectionable odors. The Department of Bacteriology of Michigan State College is in a position to advise with interested parties concerning the value and use of disinfectants. This work is under the direction of Dr. W. L. Mallmann.

A curse to the poultry industry, greater than any individual poultry disease, is the mass of worthless remedies which are used in unbelievable quantities throughout the country. Just this morning, January 13, 1944, a farmer and his wife were in and told of having spent over $50 for the most worthless junk anyone ever heard of in an effort to cure an outbreak of roup in a flock of 800 chickens. Some of the remedies used were made by a man who has no professional training whatever.

One unfortunate part of their story was to the effect that they had first gone to their local veterinarian, where they got no diagnosis, no advice, no educational suggestions regarding hygiene, sanitation or the limitations in value of medicinal treatment. All this veterinarian did was to sell them a small bottle of medicine, the nature of which was not revealed. The remedy did no good. This veterinarian was an honor student while in college and had more than the usual amount of training in poultry diseases, or, shall I say, had the opportunity to get this training. It was evidently not taken very seriously. I really believe that practicing veterinarians should take a hand in the education of our poultrymen as to fundamentals in hygiene and sanitation and show them how futile promiscuous medication really is. This cannot be done by merely selling a bottle of medicine for an undiagnosed disease.

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The Sulfonamides

Chemical Considerations

By JAMES E. GREENE
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ALTHOUGH the sulfonamide compounds are the most potent weapons of modern medicine, they have specific limitations and may be followed by disastrous results unless judiciously administered.

The chemical structure of these compounds is based on the substitution of amino and sulfonyl radicals for hydrogen in a benzene ring to form sulfanilic acid. When the —OH group of sulfanilic acid is replaced by an amino group (NH_2), the resulting compound is sulfanilamide which is the parent compound of the other members of the group. By substituting pyridine, thiazole, pyrimidine or thiazole and succinic acid for one of the hydrogen radicals of sulfanilamide, the other commonly used sulfonamides are formed. Within the body these compounds may undergo another change, acetylation, which affects their usefulness considerably. This process, which occurs principally within the liver, consists of the substitution of an acetyl ($—COCH_3$) group for one of the hydrogen of the amino group which is attached directly to the benzene ring.

Although the acetylated form is generally inactive therapeutically, the more readily acetylated products (sulfapyridine) appears to produce more toxic symptoms than sulfanilamide, sulfathiazole or sulfadiazine which are acetylated to a lesser degree. Since this conjugated compound is less soluble there is a tendency toward precipitation in the kidney, pelvis or ureters.

Mode of Action

Although the exact mechanism of the bacteriostatic properties of these compounds is, at present, the subject of much discussion, an ingenious explanation has been postulated by Woods[1], who has suggested that the sulfonamides, because of their chemical similarity, compete with para-aminobenzoic acid (an essential substance in the growth of certain bacteria) for a position in the reaction which occurs in the utilization of para-aminobenzoic acid by the bacterial cells. However, since an excess of para-aminobenzoic acid will allow unimpeded growth of the bacteria, variation of the activity of the sulfonamides occurs with respect to certain organisms. Because of this variation and consequent bacterial specificity, the selection of both the group and the individual sulfonamides should be combatible with the bacteriological indications. Other points for consideration are the rate of absorption and excretion and the amount of acetylation.

Incompatabilities

Contrary to former beliefs saline laxatives, eggs and other sulfur products are not contraindicated in conjunction with the sulfonamides. However, to the inhibiting action of para-aminobenzoic acid, local anesthetics (such as procaine), which may break down into this acid, should be avoided. Sodium salts of sulfanilamide should not be combined with parenteral fluids such as citrated blood, glucose or glucose and saline solutions because of the changes produced in the fluids by the alkalinity of the drug. Ultraviolet therapy and strong sunlight are contraindicated in conjunction with sulfonamides. However, there appears to be no contraindication for the use of inhalation anesthesia in conjunction with sulfonamides.

Toxic Reactions

Although the sulfonamides are potentially dangerous drugs, toxic reactions are not as frequent as was formerly believed. Since animals which have previously suffered untoward effects are more likely to react unfavorably, it is advisable to proceed cautiously in the second administration of the drug. There is little evidence to indicate that anemia, leucopenia, hepatitis or nephritis will be aggravated by the administration of sulfonamides. Fluid intake and urinary output should be maintained to assure adequate excretion of the drug. The most toxic reactions are nausea, drug fever, drug rashes and hematuria.

[1]Woods, D.D., 1940 *Brit. Jnl. Exp. Path.*, 21:74.

Autobiography of a Veterinary Practitioner

By E. T. BAKER, Moscow, Idaho

XXIV

Rambling Thoughts of a Veterinarian

WITH three decades of active, general practice behind me, perhaps I can justifiably indulge in a little retrospection on the kind of a life it has brought me. Would I care to live through those years again? Could I have done better in other walks of life? Have the irregular hours and sometimes laborious toil been compensated by other and more pleasant features? What are the prospects of the future? How can practitioners gain more knowledge and skill in handling their work? How can we help our country in the production of more food? What are some of our reactions towards vital domestic problems?

Progress in Our Profession

Last week I had a striking example of how our profession has advanced in a few short years. Early one morning Ray Johnson called me to see a Guernsey cow, which he said was trying to calve. She was down and one touch of her ears indicated she had milk fever. It was interfering with normal parturition. After giving her a treatment, we told Ray to keep her warm, with the hind parts slightly elevated and if she did not calve by noon to let us know. We warned him not to "pull" the calf under any circumstances. At one o'clock he called us up and said the cow had calved and both were doing nicely. No other treatment was necessary.

Now, 20 years ago, the orthodox treatment was to give a "shot" of pituitrin and then to feverishly work on "gittin' that there calf." We would then return home, feeling that a good job had been well done. However, in a few hours, usually after dark, just as a heavy snow or rain was falling, the 'phone would ring, and an excited voice would shout:

"Doc, you better come out; looks like th' whole works has come out."

We would sadly don our obstetric outfit and return, and with much muscular exertion and a few well chosen adjectives, replace the everted organs. With the victim in a totally paralyzed condition, it would be most difficult to keep the uterus in position. When she refrained from coming out of her coma, we attributed the untimely death to shock and the owner accepted our verdict with true fortitude.

Now, every time we have one of these atypical cases, and they are fairly common in our practice, we thank Greig and associates for their wonderful work.

Then, there are the "bound up" cows so often seen in country practice, and in small towns, where the owners have plenty of feed. We used to carry two-pound sacks of Maggie Sulf, tinted a delicate pink, for these conditions. Just how many poor victims were drenched to death by determined but inexperienced owners only God and His mathematically inclined angels will ever know. Then came the era of rumen stimulants, thanks to Doctor Amadon, and a new line of bovine therapeutics opened up.

Being able to handle these cases and getting the patient back to normal milk flow in a short time means more clients will call me to treat more cows, and thus a business is built up. Not long ago a dairyman said to me:

"You know, Doc, I ain't never drenched a cow since me and Matt Horrigan strangled old Bessie years ago. Gosh, the way she

choked and gasped for breath before she died was awful. Nowadays, you don't get all messed up and leave 'em with a cough, but you have them back to normal in about a week. I figger I can have you out a good many times for the price of one critter."

A quarter of a century ago, lung fever of the "ketchin' type" was the bane of young, vigorous livestock. We used to dose 'em with belladonna and digitalis and other expensive fluid extracts by the gallon. We even "smelled" like a drug store basement. We also lost around nine out of 10 cases. Then came bacterins, aggressins, serums and intravenous therapy, and now we save about nine cases out of 10 if we're called before *rigor mortis* sets in. Sulfa drugs are opening up a new field, but they will not raise the dead as yet.

About a month ago an owner of about 45 purebred Hereford cattle drove up to our home and began:

"Doc, I've got into a helluva mess down on the ranch. I went out this morning and found three dead cows and half a dozen staggering around—the whole bunch looks mighty puny to me."

Filling up our bacterin grip with various intravenous solutions, we told him to get the cattle in a corral, fix up a chute for vaccination, and we would be down that afternoon. We treated the entire herd and then isolated the sick ones. Last week he stopped at our house:

"Say Doc! you sure played hob with them cattle. You saved everyone of the blamed critters and now the OPA has fixed it so I can't sell 'em."

"Good thing you paid us when you did," we smiled, and he was on his way, another satisfied client.

In the good old days we used to lose sow after sow "down behind" and dead to the world from an eclamptic ailment of some kind or another. There may be practitioners who can look at a pig not feeling well and diagnose the ailment at one fleeting glance but we do not fall into this category. However, with the newer lines of therapy we save a surprising number and that is what counts.

Sheep, also were once a problem. Well do we remember our first outbreak of pregnancy disease in ewes. Around 600 a week were dying in an outfit of 14,000 head. We noticed they avidly licked the whitewash off the fences and gobbled up molasses treated alfalfa as though half starved, and they needed more salt. Using a little common sense therapy, we mixed slaked lime and potassium iodide in dairy salt and, strange to say, the malady ceased.

Not many years ago, many practitioners, especially in the middle west, were learning

Infectious Encephalomyelitis
"Brain fever" was causing concern among farmers in the middle west

a few things about brain fever in horses. Every now and then some farmer around here would tell me about his brother losing all his horses in Minnesota or Iowa, and ask me about it. Although I have only treated several cases, and immunized probably around a thousand head, I tried to learn all I could so that if it struck in my territory I could at least handle it as well as could be expected. The public does not realize that we dread epizootics like this as much as the owners do. They think we reap a harvest on these outbreaks but, in reality, we often lose more money than we make. When an owner loses all his animals, he cannot pay, in many cases, and we are out not only our time and labor, but much

for supplies. We also have lost many of our regular calls and have had our entire routine turned upside down.

We are sorry not much progress has been made in equine digestive disturbances, but we think this is due to several factors: First, in this mechanized age, horse owners are not horse lovers. They pay little attention to the animals and call expert assistance only when a victim is in the last stages of disease. We all know that when a case reaches a certain crisis, nothing will do much good except the vital resistance of the victim itself.

Treatment in mastitis is beginning to show a few tangible results, but until a different line of therapy can be devised, many country cows are not going to receive very thorough treatment. By the time I would make four trips out ten miles to see a grade cow, the owner would need emergency treatment for shock when I presented my bill for mileage alone.

Transportation Revolutionized

Thirty years ago we would start out early in the morning with a team and buggy and be gone nearly all day making one or two calls over dirt roads. Often, we would have to strike across a field, carrying a heavy grip. In many emergency cases, such as barbwire hemorrhages or bloat, the patient would be dead when we arrived. Sometimes, two calls would come in at the same time and we could only make one within a reasonable period.

We started out bravely to conduct a small animal practice with our general one, for we could "spay 'em while you wait." However, we soon found out this was not such a snappy combination. Just about the time a spaying case was "going under" in would come a call to see a bloated cow.

Contrast that stern and rock-bound life with present day highways and autos—even with restricted mileage. Perhaps the main thing that helped me survive those days was the fact I had been 'brung up" in a generation that accepted things as they were and made the best of it. We were taught even the "dumbest" could be taught a useful vocation with patience and "stick-to-itiveness." We were also taught to put ourselves in the other fellow's place and to take a pride in our work. Perhaps we were too docile and obeyed our masters too much, who knows, for there certainly has been a mess made of the world at the present writing.

Domestic Problems

To a simple minded country practitioner who is not overly bright, but who occasionally thinks as he drives along our highways on calls, a number of vital problems have arisen. Like cancer or murder, they are not pleasant to discuss but they are here and will have to be settled sooner or later.

First, comes the question of security for everyone who is worthy of it. Where one man amasses $1,000,000, or many times more, while 5,000,000 others go to bed hungry every night—something is going to be done to a system that allows such a one-sided condition. It will probably take some radical surgery to accomplish this.

Second, the racial question concerning the Jew, the Negro and the Yellow races in our country, will require some delicate adjustments. If the Jewish leaders are wise and far seeing they will teach their members to avoid huge boa constrictor monopolies that strangle Gentile operations. When our boys and girls return from the front they will not willingly go back to work for some rich "stay-at-home" who amassed a fortune while they were gone. $12,000 sable coats will not be very popular while thousands starve.

The Negro question, to my mind, has been handled very well by the southern people, with the exception of the poverty-ridden share cropper. Give the average Negro family a comfortable home, plenty to eat, and time to go out 'possum hunting or shoot a fairly snappy game of dice, and he is happy. They are a musical race, sociable and irresponsible, who probably get more joy out of living than do money-grabbing white people.

The question of Asiatics in our country is felt more keenly on the Pacific slope, perhaps, than elsewhere. When we first came west 34 years ago there was a "Yellow Peril" problem in California even in those early days. Here, the Japs had infiltrated into the

country and were rapidly amassing property. For the most part, in their own way, they were industrious and thrifty, but they have a different concept of living than does the Caucasian. They cannot help their oriental ideas any more than a weasel can change its disposition when it enters a hen house inhabited entirely by white chickens. Japs are just that way, and when Kipling uttered his famous saying about "East is east, and West is west, and never the twain shall meet," he said a mouthful. To attempt to interfere with their way of life by trying to "missionaryize" them was just so much time and money wasted. My wife, I am pretty sure, would not appreciate your wife coming into our home and attempting to tell her how to do her housework.

Living in the west for a long time teaches one to attend to his own business, and not to be a "Meddlesome Mattie" all over the globe. If a big oil company wants their interests protected in some foreign country let their sons do the protecting instead of your boy or mine. If, however, they need protecting in this country—that is different.

Current Events

Recollections like these rambling thoughts portray the events of our day and age better than learned historians will chronicle them in the future. Each day or month or year of our lives is a curious jumble of economics, political science and blundering. As a nation we have muddled through many wars but always managed to win the last battle. We see administrations come and go, and political dynasties vanish into the shadows of time like the ruins of the ancient mound builders.

As we have noted before, we have never voted the straight ticket for any party. When we hear of huge American corporations being closely allied with German chemical industries, even in war, we can hardly believe our ears. When we saw Japanese freighters being loaded with iron scrap and oil and even ammunition on the docks at Seattle only a few short years ago, our temperature rose several degrees. To think we have men and politicians willing to undermine our country and theirs for a profit is beyond comprehension.

We have nothing but bitter condemnation for our leaders in power who could have laid in ample supplies of rubber, quinine and many other necessities. We began to look again even before Hitler invaded Poland in 1939, and when that act materialized, we got busy in earnest. We took a locker in a storage plant, and filled it with fruits, vegetables and a little meat.

But our country muddled on. Congress said it couldn't happen to us. Experts on far eastern affairs warned our politicians how Japan would strike us, as they had struck Russia in 1904, but still we slept on. For some reason or other, we in the West regard Japan as a more dangerous enemy than we do Germany, and in the East, perhaps the opposite is true.

With our only son in the southwest Pacific area, we entertain a cold, bitter feeling towards the Japs. That feeling erases all party feeling, whether it is against a Democratic cabinet member or an isolationist Republican congressman.

For some reason or other I am not critical of much of our early and frenzied war effort, with its costly waste and useless expenditures. Something had to be done after our years of procrastination and it had to be done in a hurry. When one's house is on fire he doesn't give much thought of saving the enlarged portraits of Uncle Lem or Aunt Hattie hanging in the front parlor. Winning the war comes first and we all know war is mighty expensive at its best, or worst, rather.

At this point, let me pause to pay silent tribute to the nephews and nieces of Uncle Sam who have done such a magnificent job in turning out the sinews of war and domestic necessities. To sensible management and hard working labor, and to all who have contributed to the war effort, our thanks are due. The "little people" have certainly come through, and if politicians could only point to a similar record, our country would be in a pretty secure position. To our armed forces, wherever they may be, from the jungles of the Pacific atolls to the heights of Italy, a tribute is also due.

Politics

Coming to domestic or local politics, we are all familiar with the thrifty, hard working farmer who is elected county commissioner. He is, at first, surprised and then elated at the obeisance rendered him by numerous people who are looking for favors in a roundabout way. They feed him good old fashioned apple sauce until be believes it himself. In a short time he is a leading member of the "court house gang," and neglects his own business. Finally, a landslide comes along and retires him to private life. He comes back home disillusioned, or moves to a new location, utterly spoiled for honest toil the rest of his life.

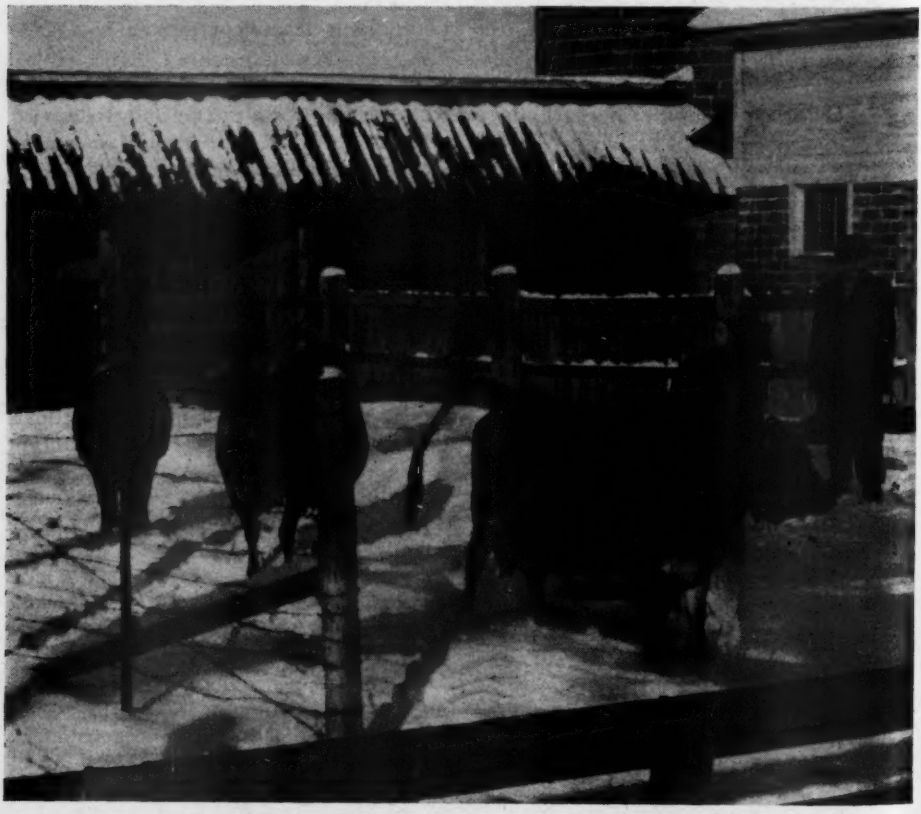
The same sad story applies to our own profession. As we look back over the years we see times when we might have been a political power instead of an obscure country practitioner. However, we have never yearned for political, civic or fraternal office but have always been content to remain a high private in the rear rank. With this in mind, we have remained in our small community taking care of our practice as best we could and retaining an independence that suits our mode of living.

We have not entered into some of the vital controversial questions of the day, such as rationing, for we feel they will right themselves. Time has a habit of doing this. Like the fellow who stood in front of the slot machine and quietly said:

Ashes to ashes,
And dust unto dust,
One more nickel;
I think it'll bust.

Forenoon Funerals Are Best

I had thought to close these "rambling thoughts" with the foregoing but the stanza of doggerel brings up another thought of very different tenor. A pathetic experience encountered in early life convinces



me that funerals should be held in the morning, preferably around ten o'clock. When the last sad rites are held in the afternoon, and the bereaved relatives return home, tired and hungry, they must forego supper until the will is read, and this often leads to immediate hostilities among the next of kin. On the contrary, when the sorrowing relations return from the marble orchard about noon, and sit down to an appetizing dinner prepared by kind friends or neighbors, a different feeling pervades the atmosphere when Lucius G. Tort, Esq., Attorney-at-Law, proceeds to read the last will and testament.

I was only in my teens when "Uncle Bob," as we affectionately called him (until after his departure from this life), was the principal character in a country funeral. He was my Grandfather's youngest brother and had remained on the old homestead. He had also remained a bachelor. My Grandfather had often said that Robert was not exactly worthless, but he couldn't think of any other word that came so close to the truth.

As a dashing bachelor, Uncle Bob had been quite a lady-killer in his day. A faded photo, taken of him at the Centennial Exhibition at Philadelphia in 1876, portrays a local Adonis. Tall and dark, with a handlebar mustache, and laughing Irish eyes and a tongue that had kissed the Blarney Stone, he was the life of the party wherever he went. Always a leader at "barn raisins'" and coon hunts, he also never failed to squire the maidens of uncertain age. He was even a discreet Romeo among the younger wives who were inclined to be a little skittish at times.

But Uncle Robert was no fool. Living by himself on the home farm he was always being invited out to Sabbath dinners by loving kinfolk or lonely spinsters. To the relatives he promised lavish gifts "when I am dead and gone," as he would always say. Just where or how this phrase originated I do not know, for one is usually gone when he is dead. However, let us not become too technical.

One day, after partaking of three or four generous snifters from my Grandfather's favorite jug of rye, and filling up on fried chicken and all the trimmings at our house, he promised me that I would be a beneficiary of his estate by receiving my deceased mother's share.

About the middle of one November, Uncle Bob went to heaven after a two-day tussle with pneumonia. Relations who had not been heard from for years showed up at the funeral. It promised to be one of the leading social functions of the early fall season. After the Presbyterian minister had preached a rousing one-hour sermon on the value of a good life, he casually referred to the fact that Uncle Bob had entered the pearly gates last Tuesday in spite of old Doctor Crawford's efforts to the contrary.

The country choir then sang "Rock of Ages," with Archie Findley always two notes behind until the last verse, when he took a short cut, and came out four notes ahead.

The bereaved relatives sat in the two front pews, and Uncle Alec and Aunt Vinnie shook with convulsive sobs, for they had been promised the largest bequests by the dashing bachelor, now deceased.

After the funeral services had been concluded, and we had all rushed back to Uncle Bob's house as fast as our teams could take us, we found Lawyer Tort, who had come all the way from the county seat to read the last will and testament. I was bequeathed $500, and could almost feel fifty crisp ten-dollar bills in my itching fingers. Then, the lawyer finished with these dramatic words:

"After all just debts have been satisfied in full."

To make a sad story much shorter, I was nicked ten dollars to help defray the funeral expenses, for Uncle Bob had departed from this life with his assets in a decidedly anemic condition. Aunt Vinnie was bitterly hostile, and declared he had been a "profligate wastrel," and had frittered away on his own selfish pleasures the money that should have been theirs. Uncle Alec added that being single should have made him happy enough without being such a spendthrift, and then we all silently faded away. After over 40 years of watching relatives fight over estates I still believe that forenoon funerals are best for all concerned.

(To be continued)

Book Reviews

How to Raise Rabbits for Food and Fur. By *Frank G. Ashbrook,* in charge Fur Resources, Fish and Wildlife Service, United States Department of the Interior. 256 pages, 66 illustrations. Published by Orange Judd Pub. Co., New York, 1943. Price $2.00.

This work gives concise, yet complete, directions for raising rabbits for meat and fur in a small way, but encouragement that rabbit culture begun as an avocation may very well develop into a profitable main enterprise. The author's extensive experience at the United States Rabbit Experiment Station at Fontana, California, where about 4,000 rabbits are raised annually, qualifies him in a special way to write such a book. The subjects discussed include: (1) Rabbit meat for the family, (2) advice to beginners, (3) location of rabbitry, (4) choosing a breed, (5) breeding, (6) feeding, (7) prevention and treatment of disease, (8) general management, (9) judging rabbits, (10) preparing rabbits for market, (11) tanning rabbit skins, (12) marketing meat and fur and (13) how to cook domestic rabbit meat, and also plans for hutches.

It is stated, a small backyard rabbitry of three or four does and a buck will supplement the family meat requirements and furnish the average family with all the rabbit meat they can use. Rabbits are grown successfully in every part of the country. Rabbit meat is nutritious and palatable and supplies variety for the family diet. Fryers weighing three to four pounds are ready for market at two months of age. The equipment required is simple—pens, nest boxes, hutches and shelters—inexpensive and can be made of salvage material, a nail keg for a nest, 5-gallon oilcan for a self feeder, waste lumber for the hutch, etc.

Complete directions are given, including detail drawings and lists of materials required for the construction of all equipment, not only for the backyard rabbitry but also for large establishments. Many formulas for feed, compounded from those available in various parts of the country, are included as are directions for management, mating, preparing the carcass for market and selling both meat and fur. Only the discussion of the prevention and treatment of disease is likely to be disappointing. But six pages are given to the discussion of this subject—little more is included than some very simple directions for keeping the animals healthy.

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Famous Dogs of Famous People. By *Mae Trovillion Smith,* 229 pages, illustrated. Dodd, Mead & Company, New York, 1944. Price $2.00.

This is a book that should delight dog lovers. The stories range through the centuries and around the world. The dogs of writers claim the major attention. The famous dogs of Alexander Pope, Lord Byron, Sir Walter Scott, Charles Dickens, William Lyon Phelps and of many living authors; dogs famous in their own right—Barry, Nero, Baldo, Igloo, Sgt. Major Jiggs, War Dogs, dogs of World War I, Dogs for Defense and White House dogs, noted mascots, etc. —make a series of fascinating stories.

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The Meat We Eat. By *P. Thomas Ziegler,* Professor of Animal Husbandry, Pennsylvania State College. 376 pages, 171 illustrations. Published by the Interstate Printers and Publishers, Danville, Ill., 1943. Price $2.70.

A wealth of information, unusual number of excellent photographs, tables and other illustrative material and a ready humor on the part of the author combine to make this new volume both practical and enjoyable. Prof. Ziegler, who has charge of the slaughtering and meat courses at Penn State, has slanted the book primarily for the farm or small-scale slaughterer, but much of the information contained in its 21 chapters will be of general industry interest.

Leading off with a description of preparations for slaughtering, the book discusses, in turn, federal and state meat inspection, hog and cattle slaughter, beef and beef by-products, lamb and veal slaughter, preservation, smoking and storing of meats, cold storage lockers, curing and tanning processes, meat as a food, federal meat grading, cutting pork and rendering lard, sausage production, beef and veal carcasses and their respective cuts, the sheep carcass and its cuts, preparing and serving meats, meat judging and identification.—*National Provisioner.*

Manual of Veterinary Clinical Pathology. By *David L. Coffin,* V.M.D., Instructor in Veterinary Pathology, University of Pennsylvania, and Fellow in Pathology, Philadelphia Zoological Society. Paper bound, spiral stitching, 120 pages, many illustrations. Published by the Author, 39th & Woodland, Philadelphia, 1944. Price $3.50.

It is difficult to speak too highly of this text. It is clear, concise, free from extraneous matter and deals with an important subject. The major divisions of the text are:

Microscopic technic; how to collect, pack and ship specimens for laboratory examination; parasitologic examinations (with excellent illustrations of parasite eggs and of some adult parasites), urine examinations and interpretations; hematologic examinations and interpretations; specific disease diagnosis; semen examinations; poultry and game-bird autopsy; solutions and reagents formulae, and stains and technic.

This little text will prove useful to the practitioner who is ambitious to do more of his own laboratory work and do it better, to the one who is desirous of making a beginning in such work and also to the man who has no time or inclination to use laboratory aids in his practice since it will enable him to use better the information supplied him by state and commercial diagnostic laboratories and better understand the veterinary and medical literature he reads. The price seems high for a book of this size.

Strouds Digest on the Diseases of Birds. By *Robert Stroud,* 483 pages, 86 illustrations. L. G. Markus, Minneapolis, Minn., 1943. Price $5.00.

The author has produced this work under severe handicaps including lack of laboratory equipment, at times without even a microscope, reference works, etc., a fact to which he too often refers in the text. Without systematic scientific training he has managed to acquire, self-taught, no inconsiderable knowledge of anatomy, histology, pathology and pharmacology and by keen observation, insatiate curiosity and much experience, has accumulated a mass of bird lore which he presents in just that way. It lacks systematic arrangement, contains many hiatuses and not a few errors but nevertheless contains considerable valuable information on a subject that has been greatly neglected by most scientific writers.

The title is too inclusive; the author's experience has been with canaries principally and it is in the field of the management of these birds, their care, feeding, breeding and their diseases that the principal contributions to the available knowledge are made. The author's comments on and interpretations of the works of others on the diseases of species with which he is less familiar than with canaries, while interesting, is not always instructive. In brief, a layman has undertaken to write in a scientific field and has done well—for a layman.

Handbook for the Etiology, Diagnosis and Control of Infectious Bovine Mastitis. By *Ival Arthur Merchant* and *R. Allen Packer,* Department of Veterinary Hygiene, Iowa State College. Paperbound, 66 pages, mimeographed. Burgess Publishing Co., Minneapolis, Minn., 1944. Price $1.25.

This booklet is essentially the authors' lecture notes on the subject for students in the Division of Veterinary Medicine at Iowa State College. It includes a brief, but comprehensive, summary of the literature on infectious bovine mastitis.

Animal Reveille. By *Richard Dempewolff,* 272 pages, many illustrations. Doubleday, Doran & Company, Garden City, N. Y., 1943. Price $3.00.

This is a stirring account of the courage and devotion of animals on the battle fronts of this and other wars. "Since the beginning of time men and animals have gone to battle side by side." Horses, mules, oxen, donkeys, camels, dogs, pigeons—even elephants—have always done important work in war. Llamas, cats, canaries, garden slugs, spiders, etc., have performed lesser parts. White mice have a tablet in Scotland's war museum to commemorate their service and their sacrifice in the laboratories of the warming up World War. Every veterinarian knows our civilization could not exist without animals; this book demonstrates that neither could modern wars be fought without them.

From the innumerable tales of the labors and antics of animals in battle and on the march, the author has selected the best and told them in a fascinating manner. This book contains much of veterinary interest and is an excellent one for the veterinari-

an's waiting room table. The splendid illustrations, most of them from official Signal Corps photographs, are atractive, interesting and informative.

Useful Bulletins, Circulars, Etc.

Breeding Difficulties of Cattle. — A brief popular discussion of this subject based largely upon Williams' "The Diseases of the Genital Organs of Domestic Animals," published by General Mills Larro Research Farm, North End Station, Detroit, Mich.

Ten Lessons on Meat for Use in Schools.—This booklet presents accurately an abundance of worthwhile information concerning all aspects of meat consumption. Distributed free by the National Live Stock and Meat Board, 407 S. Dearborn St., Chicago.

Internal Parasites of Cattle. — U. S. Dept. of Agri. circular on methods of prevention and control of internal parasites of cattle. Illustrations show various worms, flukes and protozoa as well as typical life history charts of the parasites. For sale by the Superintendent of Documents, Washington, D. C. Price 10 cents.

Urinary Calculi in Sheep.—Report of Extensive feeding trials and review of the literature. Tech. Bul. 31, Colorado Agri. Exp. Sta., Fort Collins.

Listerellosis in Domestic Animals.—A technical discussion of field and laboratory investigations. Bul. 499, Ill. Agri. Exp. Sta., Urbana.

War and Post-War Adjustment Policies.—Report of a study by Bernard Baruch and John M. Hancock. Office of War Mobilization, Washington, D. C.

Mastitis Control and Eradication.—A pictorial presentation of the cost of bovine mastitis and the measures for its control and eradication. For distribution to the dairymen through the veterinarian. Abbott Laboratories, North Chicago, Ill.

Stock Poisoning Plants of North Carolina.—Mountain laurel, white snake root, kalmia, lambkill, choke cherry, black cherry, water hemlock, jessamine buckeye, crowpoison and death camas are discussed and illustrated by drawings. Bul. 342, North Carolina Agri. Exp. Sta., Raleigh.

Pullorum Disease Eradication.—The 23rd annual report of pullorum disease eradication in Massachusetts. Control Ser. Bul. 116, Massachusetts Agri. Exp. Sta., Amherst.

Results with Mastitis in a College Herd. — Report on a 10-year program for mastitis control in the State College herd. Quarterly Bul. 26, No. 1, Michigan Agri. Exp. Sta., East Lansing.

Diseases of Sheep and Goats.—Farmers' Bul. 1943, U. S. Dept. Agri., Washington, D. C.

Coccidiosis in Feedlot Lambs.—A contribution from the Veterinary Research Laboratory, War. Cir. 4, Montana Agri. Exp. Sta., Bozeman.

Swine Breeding Research.—A discussion of experiments at Regional Swine Breeding Laboratory and cooperating experiment stations. Misc. Bul. No. 523, U. S. Dept. of Agri., Washington, D. C.

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49. Bulletins and Circulars should be requested direct from the address given in the notice. Generally they are supplied free unless a price is stated.

Sheep in Kans.—A discussion of the breeds, feeds, adaptability, care and breeding. With statistics of the industry in the state and world-wide. Kans. State Bd. of Agri., Topeka.

Self-feeder for Hogs.—Plans, specifications and detailed directions for building an outdoor self-feeder, with a capacity up to 85 pigs. Ext. Service, University of Wisconsin, Madison, Circular 339.

Nutrition and Reproduction of Farm Animals.—The third report of the Committee on Animal Nutrition of the National Research Council, Washington, D. C. Reprint and circular series No. 112. Price 25 cents.

Report of Los Angeles County Live Stock Department.—The annual report (July 1, 1942, to June 30, 1943) of L. M. Hurt, Live Stock Inspector, for Los Angeles County, California, contains a record of disease prevalence, inspections, research, animal statistics and various activities of the Department.